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Randall R. Reeves and
Edward Mitchell

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Cover photograph: White whales in Barrow Strait, 1984.
Photograph by Fred Bruemmer.

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Abstract

REEVES, R. R., AND E. MITCHELL. 1987. Distribution and migration, exploitation, and former abundance of white whales (*Delphinapterus leucas*) in Baffin Bay and adjacent waters. Can. Spec. Publ. Fish. Aquat. Sci. 99 : 34 p.

Recent surveys have revealed large concentrations of white whales (*Delphinapterus leucas*) in parts of the Lancaster Sound Region and off West Greenland. We examined unpublished historical sources, along with published literature, to evaluate early abundance, distribution, and migrations of white whales in Baffin Bay and adjacent waters. Principal sources were trading post journals in the Hudson's Bay Company Archives, Royal Canadian Mounted Police game reports, *International Whaling Statistics*, logbooks and journals of Scottish whaling voyages, and the professional papers of Thomas Southwell.

The pattern of white whale migration appears to remain essentially unchanged from what it was in the nineteenth century. After their arrival along the floe edges of Jones Sound, Lancaster Sound, and Pond Inlet in June, the whales penetrate westward into Lancaster Sound as soon as ice conditions permit. By mid-July white whales are generally absent from Pond Inlet and Lancaster Sound, except in certain bays along the south coast of Devon Island. In July and August large concentrations occur in Barrow Strait, Prince Regent Inlet, and Peel Sound. The autumn eastward migration in September takes place mainly along the south coast of Devon Island. Large numbers enter Jones Sound, but white whales are rarely found in Admiralty Inlet, Navy Board Inlet, or Pond Inlet.

An apparent hiatus in distribution exists along the northeast coast of Baffin Island, and the stock of white whales summering in the Lancaster Sound Region is considered separate from that summering in Cumberland Sound. Most circumstantial evidence supports the hypothesis that the Lancaster Sound population winters primarily off West Greenland.

A drive fishery centered in Elwin Bay, Prince Regent Inlet, was conducted by Scottish whalers during the late nineteenth century. This fishery accounted for a minimum of 10 985 white whales caught between 1874 and 1898, including 8 617 during the peak decade 1886–95. There is no evidence that this kill resulted in long-term depletion of the population. We calculate that there was a minimum of 9 000 white whales in the Prince Regent Inlet summer population in 1886. If the documented kill of white whales by West Greenland hunters during the same decade is added to the Prince Regent Inlet total, then a population substantially larger than 12 000 in 1886 is indicated.

Although documented catches in the Lancaster Sound Region have been relatively low since 1898 (*ca* < 200 per year), exploitation by Greenlanders has continued at a high level. More than 9 000 white whales were killed off West Greenland as recently as 1966–75. Judging by available evidence on past and present abundance and distribution in the Lancaster Sound Region, it is not possible to make a judgment about this whale population's conservation status. However, if it winters mainly in West Greenland and thus has been subjected to a high catch there over many years, there is reason to suspect that the present-day aggregate population is substantially smaller than the population was prior to commercial exploitation. Research designed to provide direct evidence of movement between the Lancaster Sound Region (specifically Prince Regent Inlet) and West Greenland should be a high priority for management.

Résumé

REEVES, R. R., AND E. MITCHELL. 1987. Distribution and migration, exploitation, and former abundance of white whales (*Delphinapterus leucas*) in Baffin Bay and adjacent waters. Can. Spec. Publ. Fish. Aquat. Sci. 99 : 34 p.

De récents relevés ont révélé la présence de grandes concentrations de bélugas *(Delphinapterus leucas)* dans certaines parties du détroit de Lancaster et au large de la côte ouest du Groenland. Les auteurs ont examiné des données historiques inédites et des ouvrages publiés afin d'évaluer l'abondance, la répartition et les migrations initiales du béluga dans la baie Baffin et les eaux avoisinantes. Les journaux de postes tirés des archives de la Compagnie de la Baie d'Hudson, les rapports sur le gibier de la Gendarmerie royale du Canada, les statistiques internationales sur la chasse à la baleine, les journaux de bord et les comptes rendus d'expéditions écossaises de chasse à la baleine ainsi que les écrits de Thomas Southwell constituent les principales sources de données.

Il semble que le régime migratoire du béluga soit demeuré inchangé depuis le XIX^{e} siècle. Après leur arrivée sur le bord de la banquise du détroit de Jones, du détroit de Lancaster et de l'inlet Pond en juin, les baleines se dirigent vers l'ouest dans le détroit de Lancaster aussitôt que les conditions de la glace le permettent. À la mi-juillet, les baleines blanches sont généralement absentes de l'inlet Pond et du détroit de Lancaster sauf dans le cas de certaines baies le long du littoral sud de l'île Devon. En juillet et août, on en observe de grands troupeaux dans le détroit de Barrow, dans l'inlet Prince Regent et dans le détroit de Peel. La migration vers l'est qui a lieu en septembre s'effectue en grande partie le long du littoral sud de l'île Devon. De nombreuses baleines pénètrent dans le détroit de Jones mais on en trouve rarement dans les inlets Admiralty, Navy Board et Pond.

Sur la côte nord-est de l'île Baffin, la répartition semble être fractionnée; on considère le stock de bélugas qui passe l'été dans le détroit de Lancaster comme une entité séparée de celui qui passe l'été dans la baie Cumberland. La plupart des preuves indirectes étayent l'hypothèse que la population du détroit de Lancaster hiverne surtout au large du littoral ouest du Groenland.

Vers la fin du XIX^{e} siècle, les chasseurs écossais effectuaient une pêche par abattage concentrée dans la baie Elwin et l'inlet Prince Regent. De 1874 à 1898, ils ont capturé au moins 10 985 bélugas dont 8 617 pendant la décennie de pointe allant de 1886 à 1895. Il n'y a aucune preuve que cette chasse ait entraîné l'appauvrissement à long terme de la population. Selon les auteurs, la population qui passa l'été dans l'inlet Prince Regent en 1886 comptait au moins 9 000 individus. Si l'on ajoute à ce total les prises documentées de bélugas par les chasseurs de l'ouest du Groenland pendant la même décennie, les effectifs de la population dépassent nettement 12 000 individus en 1886.

Quoique les captures documentées dans le détroit de Lancaster aient été relativement faibles depuis 1898 (moins de 200 par an), les Groenlandais ont continué à surexploiter le béluga. Récemment encore (1966–1975), plus de 9 000 bélugas ont été tués au large de l'ouest du Groenland. D'après les données disponibles sur l'abondance et la répartition passée et actuelle dans le détroit de Lancaster, il n'est pas possible de déterminer le statut de conservation dont devrait faire l'objet cette population de baleines. Toutefois, si elle hiverne surtout dans les eaux de l'ouest du Groenland et a donc fait l'objet d'une chasse intense pendant de nombreuses années, il y a raison de croire que la population actuelle regroupée est nettement plus petite qu'elle ne l'était avant l'exploitation commerciale. La recherche visant à fournir des preuves directes du déplacement entre le détroit de Lancaster (plus précisément de l'inlet Prince Regent) et l'ouest du Groenland devrait s'inscrire à l'ordre des priorités pour les gestionnaires.

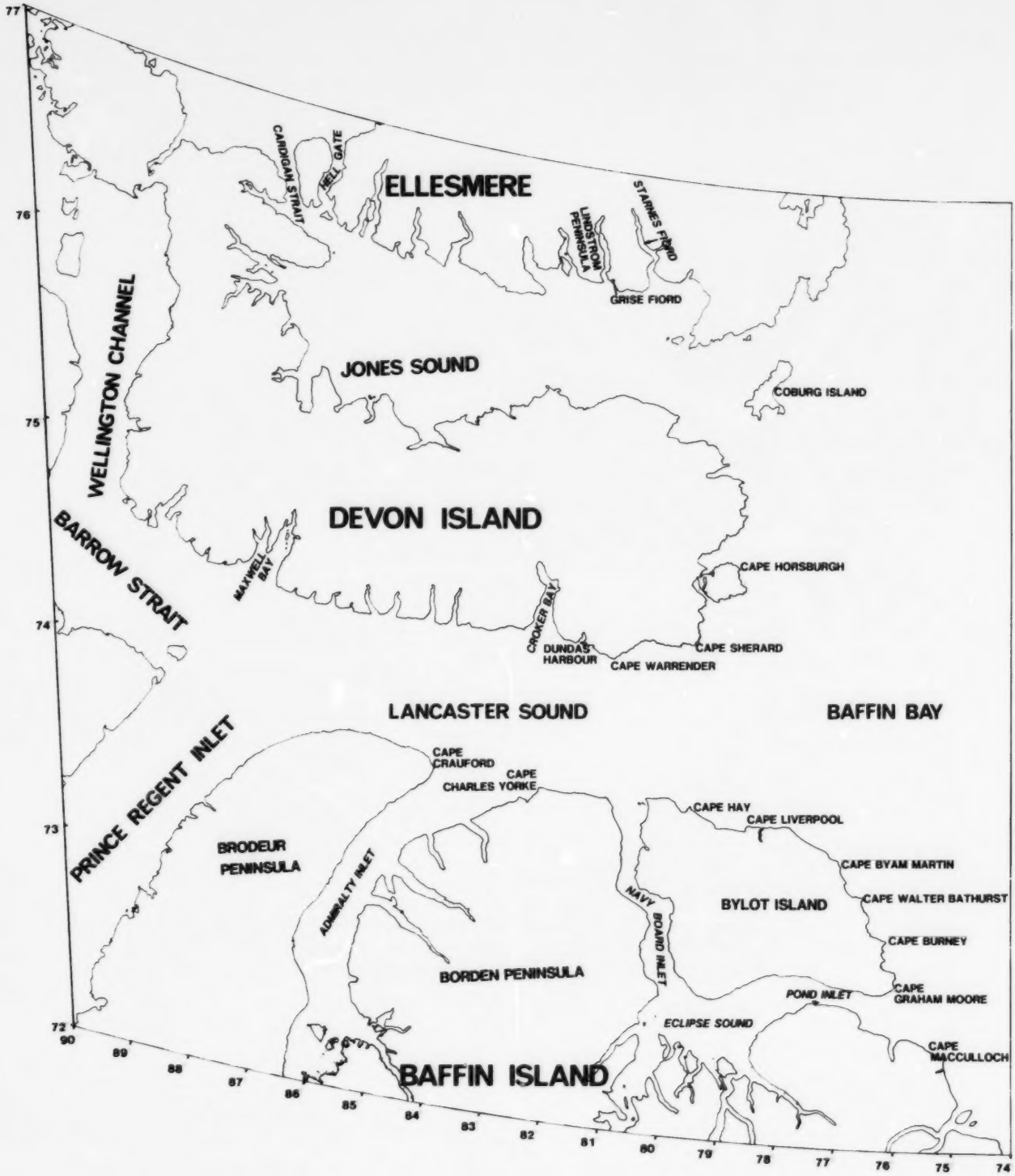

FIG 1. The Lancaster Sound Region.

Introduction

During the 1970's the Canadian oil and gas industry, faced with governmental regulations requiring environmental assessment prior to exploration and development in frontier areas, sponsored extensive surveys of wildlife in the eastern Canadian Arctic (e.g. Sutterlin and Snow 1982, and associated papers). These studies resulted in a dramatic increase in knowledge about present-day distributions, migrations, and sizes of marine mammal populations, including those of the white whale or beluga, *Delphinapterus leucas*. The main approach used to assess white whale populations was aerial survey which, though expensive, is clearly a rapid and cost-effective means of determining the distribution and relative abundance of marine mammals.

Historical research provides a valuable perspective on the current status of wildlife populations. Though it may be argued that a stock of whales can be managed adequately with information on *present* population size, recruitment, and rate of removal alone, we consider it useful to know something about historic levels of abundance, habitat use, and exploitation as well. The International Whaling Commission's (IWC) Scientific Committee has, since 1976, made its management recommendations largely on the basis of what percentage of initial (pre-exploitation) population size is represented by the current population size. The IWC's classification of whale stocks presupposes that the maximum sustainable yield (MSY) level for whales is somewhere between 50 and 70% of the initial stock size (IWC 1978, p. 43). White whale stocks are not managed within the IWC, and there is no particular reason to expect national regulatory agencies to apply the MSY concept to their management of subsistence whale fisheries. They may well decide, on political, cultural, or nutritional grounds, to allow continued harvests from whale populations far below the theoretical MSY level. In such cases, managers may choose to ignore the historical evidence of much larger and more widely distributed stocks than exist today. However, we believe that such historical evidence and the conclusions that follow from it should be made available as background for fully informed discussion and decisions.

In this paper we present some previously unpublished data on white whales in the Lancaster Sound Region (LSR), defined here as the area from Peel Sound and Franklin Strait east to northwest Baffin Bay and Smith Sound, including the northern Baffin Island and Queen Elizabeth Islands areas as well as Prince Regent Inlet and the Gulf of Boothia (Fig. 1), and off West Greenland. These data, evaluated along with published information, allow us to consider aspects of seasonal distribution, stock identity, catch history, and early abundance of the white whales in the LSR and elsewhere in Baffin Bay and Davis Strait. Do the whales still occupy the same areas in summer and follow the same migration routes as they did historically? How intensively have these whales been exploited? Is there evidence of trends in abundance which could be linked to varying degrees of exploitation, habitat modification, or other factors? How does current population size compare to initial population size? Finally, are there any immediate conservation problems for white whales in these areas, and what research should be done to help ensure the population's long-term viability?

Previous Literature

In an earlier paper we discussed the stock relationships of a population of white whales that summers in Cumberland Sound, off the southeast coast of Baffin Island, and concluded that it should be managed as a discrete stock (Mitchell and Reeves 1981). We reconstructed the history of that stock's exploitation and made a conservative estimate of its size in 1923, based on cumulative catch. The Cumberland Sound stock is severely depleted, having declined to a current size of no more than about 12% of initial (also see Orr and Richard 1985; Richard and Orr 1986).

Studies completed recently on other white whale stocks in eastern Canada have concluded that they, too, are discrete from those off West and North Greenland and in the LSR (Finley et al. 1982; Reeves and Mitchell 1984; 1987a; 1987b).

Heyland (1974) identified five sites in the eastern Canadian High Arctic where white whales congregate in summer (Fig. 2): (1) Cunningham Inlet, in Barrow Strait; (2) Elwin Bay, in Prince Regent Inlet; (3) Maxwell Bay, in Lancaster Sound; (4) the vicinity of Cape Kater, in Prince Regent Inlet; and (5) and an unnamed creek, which he called "White Whale Creek", north of Cape Kater (Fig. 3). Using photographs, Heyland counted 1 724 white whales in Cunningham Inlet on 30 July 1973.

Sergeant and Brodie (1975) estimated that at least 10 000 white whales summer in the LSR, based on "incomplete surveys". They indicated concentrations in early August 1973 of at least 1 000 whales in each of three sites in Prince Regent Inlet (Creswell Bay, Elwin Bay, and Heyland's "White Whale Creek"), one on the north coast of Somerset Island (Cunningham Inlet), and two on the southwest coast of Devon Island (both in Maxwell Bay). Jones Sound and Smith Sound were not mentioned in Sergeant and Brodie's review of white whale summer populations in North America.

Davis and Finley (1979) presented a summary of white whale distribution, migrations, and abundance in the Central and Eastern Canadian High Arctic, based principally on more than 180 000 km of aerial surveys flown between 1974 and 1978. Many of these surveys were non-systematic, reconnaissance-type overflights. Their estimate of 12 250 - 14 000 white whales in the population wintering off West Greenland and summering in the "Central Arctic", the Thule district, and Melville Bay was used by the IWC's Scientific Committee in its review of world white whale stocks in 1979 (IWC 1980, p. 120). The largest concentration found by Davis and Finley was in Creswell Bay, where an estimated 3 900 whales were seen on 14 August 1975 (Finley 1982).

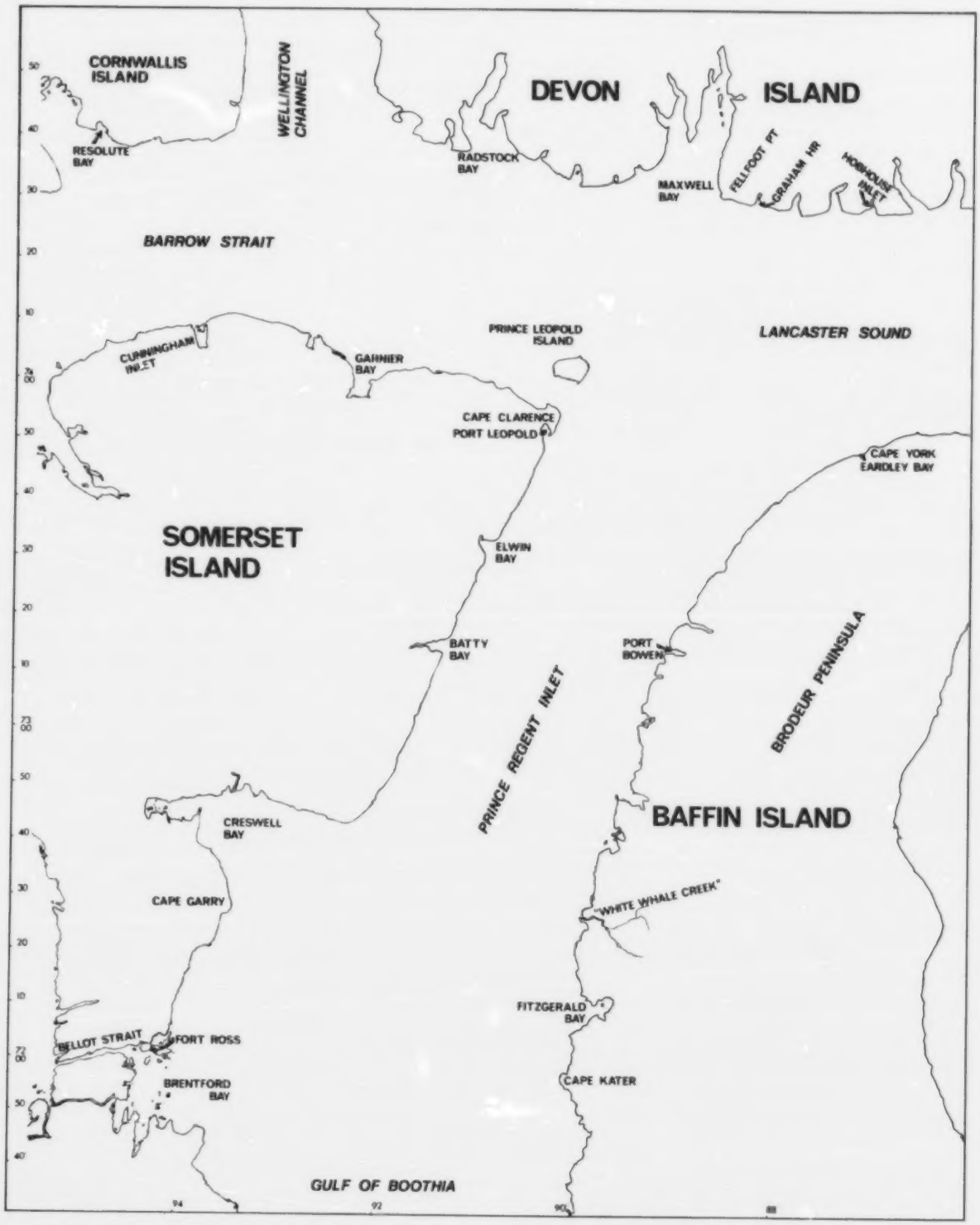

FIG 2. Prince Regent Inlet and Barrow Strait, showing principal embayments where white whale concentrations occur.

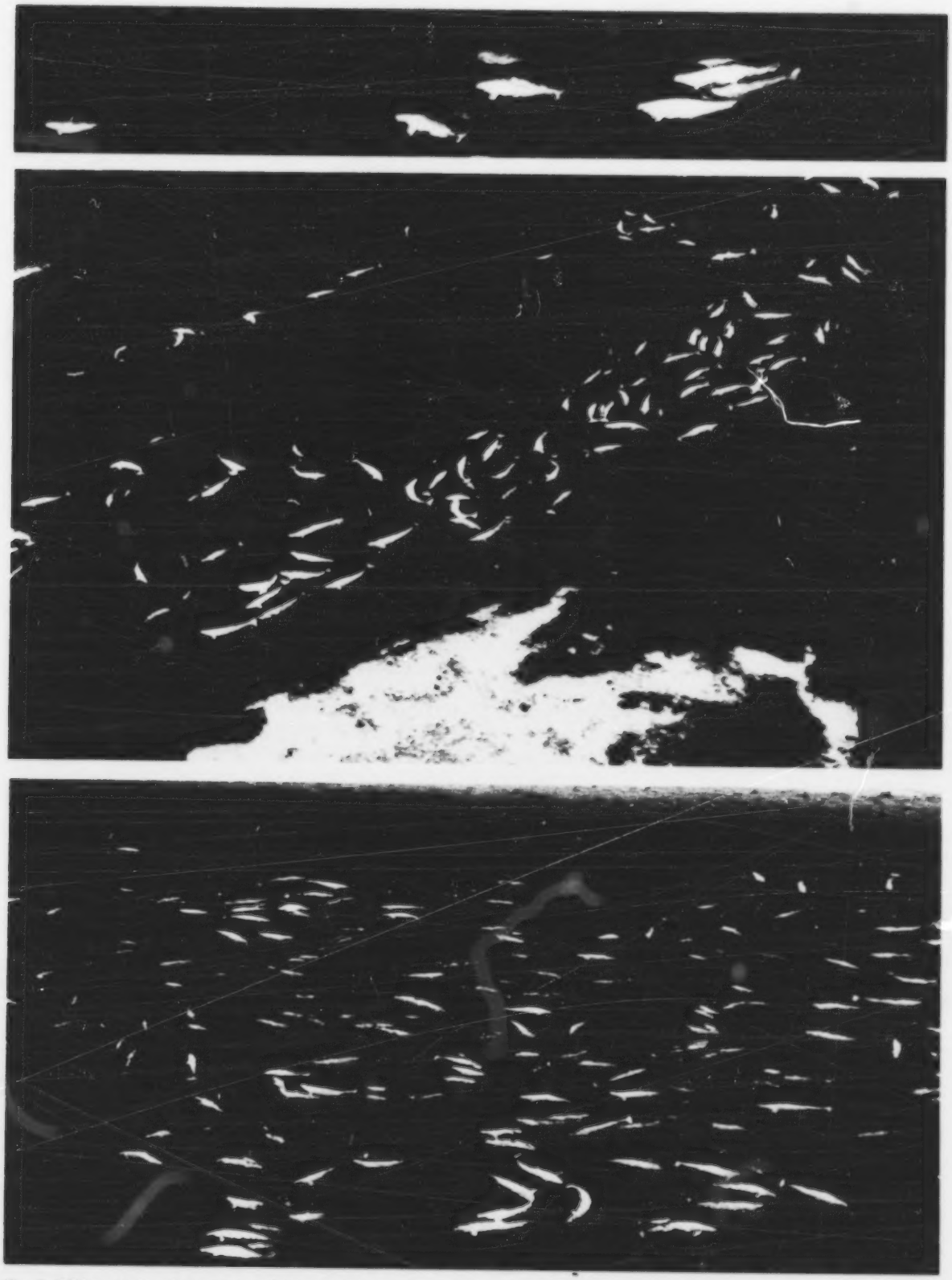

FIG 3. White whales observed at "White Whale Creek", north of Fitzgerald Bay on the west coast of Brodeur Peninsula, 3 August 1973. Photographs by J.D. Heyland.

Smith et al. (1985) estimated a total Canadian High Arctic population of 6 264 – 18 564 white whales, based principally on a systematic strip-transect survey of Lancaster Sound, Barrow Strait, and Prince Regent Inlet during July 1981. These authors commented on seasonal distribution, noting in particular the possibility that Peel Sound may be an important center of white whale summer distribution not covered in their surveys. They also did not cover Jones Sound and the Queen Elizabeth Islands area (except the south coasts of Devon and Cornwallis islands).

Materials and Methods

Hudson's Bay Company Archives

As in several earlier studies (Mitchell and Reeves 1981; Reeves and Mitchell 1984; 1987a; 1987b) we used documents found in the Hudson's Bay Company Archives in Winnipeg, Manitoba. Since the Hudson's Bay Company (HBC) did not establish permanent trading posts in the eastern Canadian High Arctic until the 1920s (Usher 1971; Fig. 4), the relevant material from these archives refers only to years after 1920. We read and indexed 48 post journals for white whale sightings, kills, and attempted kills (Tables 1, 2). This does not include the Pangnirtung post journals, as the white whale data from these were reported previously (Mitchell and Reeves 1981).

FIG 4. Settlement at Pond Inlet, *ca* 1926. Courtesy Hudson's Bay Company, file C-12, #C-345.

RCMP Game Reports

For the period 1949 to 1974 the Royal Canadian Mounted Police (RCMP) compiled annual game reports from Arctic settlements, and these have been used previously in attempts to estimate whale catches, by settlement (Smith and Taylor 1977; Mansfield et al. 1975; Mitchell and Reeves 1981). We used these reports in the present study, along with other unpublished and published sources, to estimate white whale catches, by year and by settlement, between 1953 and 1984 (Table 3), and to aid in understanding white whale distribution and migratory habits in the LSR.

International Whaling Statistics

Catches of white whales in the Canadian Arctic since 1951 are reported in *International Whaling Statistics* (*IWS*), a set of tables published annually through 1984 by the Committee for Whaling Statistics, Oslo, Norway (Table 3). The catches are broken down into broad regional categories which do not necessarily represent stock units. Harvest monitoring has been incomplete, and the responsibility for official statistical record-keeping in Arctic Canada has been divided among several different agencies over the years (Smith and Taylor 1977, p. 14 – 16; Mitchell 1982, p. 162 – 163). Consequently, we do not attribute a high degree of reliability to the yearly catch figures reported in *IWS*. For example, the listed catch for Resolute in 1976 is 11 whales, but Kemp et al. (1977 *in* Peterson 1979, p. 2529) gave the catch for the Resolute area (including Creswell Bay in western Prince Regent Inlet) as 23 that year.

The *IWS* tables also do not take account of hunting loss, which in some white whale fisheries is considerable (e.g. Kemper 1980; Fraker 1980; IWC 1980, p. 120). In most years the bulk of the Eastern Arctic total has come from Pangnirtung, where the Cumberland Sound stock is hunted (Brodie 1971; Kemper 1980). For many years, different totals are listed in different volumes of the *IWS*. On Table 3 we used the most recent listing for each year.

Whaling Logbooks and Journals

White whales were sometimes hunted by the commercial pelagic whalers who came to Davis Strait and Baffin Bay in pursuit of bowhead whales, *Balaena mysticetus* (Lubbock 1937). Particularly after 1868, once bowheads

TABLE 1. Hudson's Bay Company post journals examined in this study for information on white whales.

Name of Post	Bordering on	No. of Journals	Period Covered	Archival Code
Arctic Bay	Admiralty Inlet	6	1937 – 41	B.381/a/1 – 6
Clyde River	Baffin Bay	6	1930 – 39	B.403/a/1 – 6
Dundas Harbour	Lancaster Sound	3	1934 – 36	B.407/a/1 – 3
Igloolik	Northern Foxe Basin	1	1940	B.422/a/1
King William Island	Rasmussen Basin	9	1926 – 34	B.427/a/1 – 9
Pond Inlet	Pond Inlet	16	1921 – 39	B.465/a/1 – 16
Fort Ross	Prince Regent Inlet	7	1937 – 43	B.474/a/1 – 7

TABLE 2. Information on white whales (or whales, species unspecified) contained in Hudson's Bay Company post journals, 1921 - 43, and other manuscript sources. For posts covered, see Table 1.

Date	Locality	Number of Whales			Comments	Archival Code
		Secured	Struck/Lost	Sighted		
28 Nov. 1928	Pond Inlet				"Akoomalik left to hunt white whales today".	B.465/a/8, fo. 14
3 Dec. 1928	Pond Inlet	0			"Akoomalik arrived late tonight and reports getting no whales".	B.465/a/8, fo. 14d
16 May 1929	Button Point, Pond Inlet floe edge		1		Killed but sunk.	B.465/a/8, fo. 28
2 July 1932	Pond Inlet	1				B.465/a/12, fo. 5
20 Oct. 1932	Clyde River		1		"Shot twice".	B.403/a/3, fo. 35
19 - 29 Sept. 1934	Dundas Harbour	34	4 (killed)	"Hundreds"	Post motorboat used to help drive whales into harbor; used mainly for dogfood.	B.407/a/1, fo. 6-15
10 Apr. 1935	Dundas Harbour			["Large school"]	Seen "amongst the floe ice." Later determined that these were narwhals.	B.407/a/1, fo. 96
7 May 1935	Dundas Harbour, floe edge			"A considerable number"	Narwhals and walruses seen, too.	B.407/a/1, fo. 104
18 - 20 May 1935	Dundas Harbour, floe edge	1		"Schools"; "many"		B.407/a/1, fo. 107 - 108
9 June 1935	Dundas Harbour, in open water			Many	Attempt made, but no catch.	B.407/a/2, fo. 3
26 June 1935	Dundas Harbour			Some	"In the offing".	B.407/a/2, fo. 8
4 July 1935	Dundas Harbour				"Large whale" seen; probably a bowhead.	B.407/a/2, fo. 11
25 July 1935	West of Dundas Harbour, along Devon Is. coast			"Several large schools"		B.407/a/2, fo. 18-19
31 July 1935	Dundas Harbour				"White whales conspicuous by their absence."	B.407/a/2, fo. 21
18 Apr. 1936	Dundas Harbour				"The whale hides had to be used as dogfeed".	B.407/a/3, fo. 12
24-30 June 1936	Dundas Harbour	2	2	"Many"	Hides traded to HBC; 2 narwhals and a walrus also killed but lost.	B.407/a/3, fo. 31 - 32
15-19 July 1936	Dundas Harbour	2		"A school"	Whale nets set in harbour; white whales "very scarce" by 19 July.	B.407/a/3, fo. 33 - 37
July 1936	Graham Harbour	1		"Many"		B.407/a/3, fo. 38
July 1936	Radstock Bay			"Thousands"		B.407/a/3, fo. 38
21 - 22 July 1936	Dundas Harbour			2 schools	Water clear, nets ineffective; chased in motorboat "but could not corner them"; "many schools of little tommy cod were seen".	B.407/a/3, fo. 42
15 July 1937	Pond Inlet				"Saw a number of White Whales."	Turner, 1928 - 1946MS
22 Sept. 1937	Fort Ross	2[?]			Native killed 2 "whales" in the harbor; first successful whale hunt at this post.	B.474/a/1, fo. 4
14 Sept. 1938	Near Elwin Inlet, Admiralty Inlet	5			"Large schools of Narwhal and porpoise" seen; "a few" shot.	B.381/a/3, fo. 34
12 Oct. 1941	Fort Ross, at "opposite end of Long Island"			+[?]	"Several whales" seen.	B.474/a/5, fo. 18
11 Aug. 1942	Fort Ross, Transition Bay			+[?]	"Several whales" seen; hunt was unsuccessful.	B.474/a/6, fo. 12
6 Aug. 1943	Fort Ross, Hazard Inlet			+[?]	"A few whales" seen.	B. 474/a/7, fo. 10
10 Aug. 1943	Fort Ross			ca 18[?]	"Whales" seen, species not specified; hunted by natives without success. ("Several" tusked narwhals seen in harbor 11 August.)	B.474/a/7, fo. 11
18 Aug. 1943	Fort Ross			+[?]	"Nearly every day now whales are seen in one of the neighboring bays."	B.474/a/7, fo. 11

TABLE 3. Reported white whale catches in the Lancaster Sound Region, 1951 - 84. Except as noted, data are from RCMP Game Reports, the Northwest Territories Government, or the Canadian Department of Fisheries and Oceans.

Location	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Arctic Bay	—	—	—	—	—	—	0	0	0	—	—	—	—	—	—	—	1[a]	—	—	—	—	—	—	2	—	0	0	0	31	0	0	3	0	13
Alexandra Fiord	—	—	0	0	—	0	0	0	0	0	0	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Clyde (Cape Christian)	—	—	—	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	—	—	—	0	0	—	0	0	0	0	0	0	1	0
Creswell Bay	—	—	—	—	—	—	—	0	—	—	+	—	—	—	—	10	5	+	0	—	—	—	—	—	16[b]	—	—	1	—	—	—	—	—	0
Grise Fiord (Craig Harbour)[c]	—	—	—	—	14	6	15	5	25	35	10	75	83	20	48	38[d]	0	0	0	0	0	—	—	6	10	15	11	15	12	16	47	6	6	21
Pond Inlet	—	—	0	0	2	1 - 2	0	0	26	0	14	10	0	0	0	1[a]	0	0	—	0	—	—	—	0	—	0	0	0	2	0	0	0	1	0
Resolute	—	—	—	—	—	—	34	77	94	92	98	46	26	3	3	16[e]	11	10	25	—	36	—	—	16	4	11	17	1	6	—	8	8	18	1
Spence Bay	—	—	—	—	—	—	2	0	0	10	+	0	0	0	3	2	0	+	0	0	—	—	—	—	—	—	—	—	—	—	—	0	15	12
Thom Bay	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	0	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals	—	—	0	0	16	9 - 10	49	82	145	138	122+	132	109	23	54	67	17	10+	25	0	36	—	—	24	30	26	28	17	51	16	55	17	41	47
From *International Whaling Statistics:*																																		
Canada	883	992	986	1027	789	626	1044	831	843	963	248	660	787	866	769	933	761	722	355	411	13	277	652	875	1093	1085	1307	702	884	774	689 - 709	475	484	—
Of which,																				(incomplete)														
Central Arctic	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	28	—	—	—
Eastern Arctic	292	204	285	201	232	138	199	279	487	308	—	172	133	109	38	69	214	56	37	100	10	61	208	239	140	239	286	160	200	133	232 - 252	191	—	—

[a] Bissett (1968a, p. 70, 72); [b] Davis and Finley (1979, p. 31); [c] Also see Riewe (1977); [d] 80 - 90 more taken at *savssiet* at mouth of Starnes Fiord (Freeman 1968); [e] Also see Bissett (1968b, p. 144).

had become less easy to find, large catches of white whales were made by certain British whaling vessels involved in the Davis Strait whale fishery. In a previous compilation based principally on published sources, many of these catches were referred only to Davis Strait or to Davis Strait and Prince Regent Inlet, with exact locations not specified (Mitchell and Reeves 1981, table 10). Ross and MacIver (1982) mapped the positions of 2 704 white whale kills by pelagic whalers, extracted from 145 logbooks and other whaling manuscripts. They also plotted 10 668 additional kills, from Mitchell and Reeves (1981, table 10) and other, unspecified sources.

Using sources listed in our earlier table (Mitchell and Reeves 1981, table 10), we attempted to identify vessels involved in the large-scale catching of white whales in the LSR. We then surveyed the holdings of museums and archives in Great Britain, Canada, and the United States in hopes of finding logbooks and journals from these vessels, containing first-hand accounts of white-whale drives. Data on white whales were extracted from those found, as well as from a sample of whaling manuscripts read in original or as obtained on microfilm during previous studies (Tables 4, 5). The most valuable source of logbooks for this study was the Whaling Logs Collection in the Public Archives of Canada (PAC) (Salmon 1982). This collection was purchased by the PAC in 1980 and contains 42 Scottish whaling logbooks and journals covering the period 1873 to 1910.

Southwell Papers

Among the extensive manuscript holdings of the Scott Polar Research Institute in Cambridge, U.K., are a collection of letters, news clippings, and other papers kept by Thomas Southwell (Holland 1982, p. 659). These documents formed much of the basis for Southwell's annual published reports on the British whale and seal fisheries, 1882-1908 (Southwell 1884 *et seq*). We searched the Southwell Papers to help clarify localities and totals for certain British white whale catches.

Scottish Whaling Returns

Some of the catches of white whales reported in secondary sources were actually of narwhals (*Monodon monoceros*). In fact, we found many inconsistencies between the catch data reported in logbooks and those obtained from secondary sources (Table 6). It is clear that in some instances at least, narwhals were listed generically as "white whales" in the Scottish whaling returns. However, some of the discrepancies between published figures and those derived from logbooks and journals remain unexplained.

A logbook from a bowhead whaling voyage may contain only a partial record of the kill of white whales and narwhals. However, there is often a list at the beginning or end of the logbook, giving total catches of all commercially significant species. Whenever such a list was available, we considered the logbook an authoritative source of catch data. When no such list appeared in the logbook, we had to assume that the catches mentioned in daily entries represent a conservative estimate of the total catch made on the voyage.

Table 4. Observations of white whales by commercial whalers and exploring parties, 1839 - 1906. Note that large kills made by driving whales in Prince Regent Inlet are not included here - see Table 5.

Date	Locality	Number of whales		Source
		Secured	Sighted	
15 Apr. 1824	Close to shore, near a Danish factory at West Greenland (Wideford or Weide River)		"Several"	Cass 1824MS
7 June 1831	NW Greenland between Horse Head and Loom Head		"Great numbers"	Surgeon aboard *Hercules in* Ross 1985, p. 40
6 June 1839	*Ca* 72°10′N, Upernavik district, W. Greenland		"A great number"	*Abram* 1839MS
Late April 1850	South of Disko Bay, West Greenland		"Very numerous"	Sutherland 1852, vol. I, pp. 28-29
Late August 1850	Barrow Strait, at mouth of Wellington Channel		'In great abundance"	Sutherland 1852, vol. I, p. 293
17-19 June 1851	Southeastern Queens Channel		"Very numerous"	Sutherland 1852, vol. II, p. 150
28 July 1851	Assistance Bay		Some	Sutherland 1852, vol. II, p. 267
26 July 1851	Wellington Channel		Some	Sutherland 1852, vol. II, p. 263
10 Aug. 1859	Brentford Bay, Prince Regent Inlet		Some	M'Clintock 1859, p. 332
11 Aug. 1859	Creswell Bay	1		M'Clintock 1859, p. 334
2 June 1873	*Ca* 69-70°N, off W. Greenland	1 (found)		*Victor* 1873MS
18 Aug. 1873	*Ca* 30 mi off Cape Adair, Baffin Bay		1 (dead)	Markham 1875, p. 264
30 June, 2 July 1884	Lancaster Sound		"Many"; "hundreds"	Lindsay 1911, pp. 151, 154
6 August 1884	Floe edge in Lancaster Sound		"Swarms"	Lindsay 1911, p. 195
16, 19, 26 July 1884	Floe edge in Lancaster Sound		"Some"	Lindsay 1911, pp. 175, 181, 188
9 July 1884	Floe edge in Lancaster Sound		"A great many"	Lindsay 1911, p. 170
31 May 1885	N of Upernavik		"Many"	*Esquimaux* 1885MS
27 June 1885	Lancaster Sound, near Adams Is., Navy Bd. Inlet		A "number"	*Esquimaux* 1885MS
1 July 1885	73°46′N, 88°49′W		"A large number"	*Esquimaux* 1885MS
6 Aug. 1885	Graham Harbour		"Numerous"	*Esquimaux* 1885MS
5 June 1887	69°20′N near Hare Island		"Good many"	*Esquimaux* 1887MS
11 June 1887	Off Cape Shackleton		"Very numerous"	*Esquimaux* 1887MS
12 June 1887	73°55′N, 59°29′W		"Very numerous"	*Esquimaux* 1887MS
16 June 1887	Near Cape York, Melville Bay		"A few"	*Esquimaux* 1887MS
1,8 Aug. 1887	Port Leopold		"A few"	*Esquimaux* 1887MS
23 Aug. 1887	W of Stratton Creek (Hobhouse Creek)		"Very numerous"	*Esquimaux* 1887MS
26 August 1887	Croker Bay		"Numerous"	*Esquimaux* 1887MS
4 June 1888	N of Horse Head [N of Upernavik]		Some	*Esquimaux* 1888MS
9 June 1888	Jones Sound		"Very numerous"	*Esquimaux* 1888MS
28 June 1888	73°15′N, 89° 30′W		"A few"	*Esquimaux* 1888MS
30 Apr. 1891	*Ca* Rifcol or 68°N a few mi offshore from Greenland		"A few"	*Maud* 1891MS
11 June 1891	*Ca* 76°N, 77°30′W		"Very numerous"	*Maud* 1891MS
19 June 1891	Mouth of Jones Sound		"Very numerous"	*Maud* 1891MS
24 June 1891	Jones Sound		"A few"	*Maud* 1891MS
2 - 4 July 1891	Croker Bay		"Numerous"	*Maud* 1891MS
9 July 1891	Maxwell Bay		"Very numerous"	*Maud* 1891MS
9 June 1892	Melville Bay		"A few"	*Maud* 1892MS
26 Apr. 1893	Near Kangamiut, W. Greenland		Some	*Eclipse* 1893MS

2, 7 May 1893	Off Godhavn, W. Greenland		"A number"	*Eclipse* 1893MS
22 May 1894	*Ca* 5 mi W of Disco Bay		"A good many"	*Eclipse* 1894MS
10 June 1894	In hole in pack, 12 June position 71°20′N, 55°W		"A few"	*Eclipse* 1894MS
12 June 1897	Near Whale Sound going NW		Some	*Eclipse* 1897MS
June 1897	A few miles above Navy Board Inlet towards Crocker Bay [sic]		"Numerous"	*Eclipse* 1897MS
26 May 1898	30 mi off Fortune Bay		"A lot"	*Diana* 1898MS
3 Aug 1898	Port Leopold Harbour		"Large school"	*Diana* 1898MS
13 May 1899	Probably near Holsteinsborg, W. Greenland		Some	*Esquimaux* 1899Msa, b
16 May 1899	Disko Bay		"A shoal"	*Esquimaux* 1899MSa,b
28 May 1899	N from Wilcox Head, N.W. Greenland, swimming N		"A large school"	*Esquimaux* 1899MSa,b
8 June 1899	Lancaster Sound, off Navy Board Inlet		"A few"	*Diana* 1899MS
9 June 1899	Lancaster Sound floe edge		"Many"	*Esquimaux* 1899MSa,b
18 - 19 June 1899	Lancaster Sound floe edge, W of C. Liverpool		"Many"	*Esquimaux* 1899MSa,b
6 July 1899	*Ca* 30 mi off C. Liverpool		"Numerous"	*Eclipse* 1899MS
9 July 1899	Mouth of Navy Board Inlet		Tens	*Esquimaux* 1899MSa,b
12 July 1899	Mouth of Navy Board Inlet		"Many"	*Diana* 1899MS
17 May 1900	*Ca* 15 mi SE of Resolution Is., 61°23′N, 64°12′W		"A few"	*Diana* 1900MSa
8 July 1900	Pond Inlet floe edge		Some	*Diana* 1900MSb
9 May 1903	Near pack ice edge N of Riffkoll, W. Greenland		"A few"	*Diana* 1903MS
20 May 1903	*Ca* 20 mi N of Rifkol Hill, W. Greenland		Some	*Diana* 1903MS
22 May 1904	"Disko Water", W. Greenland		"A few schools"	*Diana* 1904MS
22 June 1904	21 June at 75°57′N, 64°W		"Some"	*Eclipse* 1904MS
25 May 1905	68°20′N, 55°W		"A few"	*Morning* 1905MS
28 May 1905	Near Disco Island	1		*Morning* 1905MS
30 May 1906	Off N end of Hare Island near Nugsuak, W. Greenland		"A good many"	*Eclipse* 1906MSa

Table 5. White whale catches by Scottish whalers in Prince Regent Inlet, mainly in Elwin Bay.

Year	Vessel (Master)	Confirmed Catch	Probable Catch	Possible Catch	Sources
1874	*Arctic* (I) (Adams)	32			*Dundee Advertiser* 11 Sept. 1874
1877	*Aurora*	550			*Dundee Advertiser* 6 and 13 Nov. 1877
1877	*Arctic* (II)			385	*Dundee Advertiser* 13 Nov. 1877
1880	*Arctic* (II) (Adams)		600		*Dundee Year Book* 1880
1883	*Aurora* (Fairweather) *Esquimaux* (Milne)	800			Fairweather and Fairweather 1928, p. 43; Lindsay 1911, p. 154
1883	*Arctic* (II) (Adams)			1 110 - 1 220	Lubbock 1937, p. 413 - 414, 462; Southwell 1884, p. 299
1883	*Polynia* (Walker)			725	Southwell Papers
1883	*Thetis* (Fairweather)			791	Lubbock 1937, p. 413, 462; Southwell 1884, p. 299
1885[a]	*Resolute* (Jackman)			200	Southwell Papers; *Dundee Year Book*
1885[a]	*Esquimaux* (Milne)	2 [By harpooning]			*Esquimaux* 1885MS

1886	*Esquimaux* (Milne)	399 - 410			*Esquimaux* 1886MS; Lubbock 1937, p. 419; D.S. Henderson in litt.; St. John's (Nfld.) *Evening Telegram* 19 Nov. 1886
1886	*Eagle*	4(+?)[b]			*Esquimaux* 1886MS
1886	*Terra Nova* (Fairweather)	630			*Esquimaux* 1886MS; Lubbock 1937, p. 419; D.S. Henderson in litt.
1887	*Esquimaux* (Milne)	589 - 600			*Esquimaux* 1887MS; Lubbock 1937, p. 419; *Dundee Advertiser* 7 Nov. 1887
1887	*Active*[c] (Brown)			571	Lubbock 1937, p. 419; D.S. Henderson in litt.
1887	*Aurora* (Fairweather)	180			*Esquimaux* 1887MS; Lubbock 1937, p. 419; D.S. Henderson in litt.
1887	*Terra Nova* (Fairweather)	580			*Esquimaux* 1887MS; Lubbock 1937, p. 419; *Dundee Advertiser* 7 Nov. 1887
1887	*Eagle*	40 tuns, est. 260 whales			*Esquimaux* 1887MS; St. John's (Nfld.) *Evening Telegram* 7 Nov. 1887
1888	*Maud*[d] (Adams)	300			Lubbock 1937, p. 420; Southwell 1889, p. 125 - 126
1888	*Nova Zembla*[e] (Phillips)		450 - 492		*Esquimaux* 1888MS; D.S. Henderson in litt.; St. John's (Nfld.) *Evening Telegram* 11 Oct. 1888
1888	*Earl of Mar & Kellie*[e] (Walker)		120 (20-25 tons) - 400		*Esquimaux* 1888MS; St. John's (Nfld.) *Evening Telegram* 11 Oct. 1888; Southwell Papers; *Dundee Year Book 1888*
1890	*Polynia* (Milne)	317			*Polynia* 1890MS; Lubbock 1937, p. 422; Southwell 1891, p. 123 - 124; D.S. Henderson in litt.; Southwell Papers
1890	*Aurora* (Mackay)	315			*Polynia* 1890MS; Southwell 1891, p. 123; D.S. Henderson in litt.; Southwell Papers
1890	*Nova Zembla* (Phillips)	174			*Polynia* 1890MS; Southwell 1891, p. 123; D.S. Henderson in litt.; Southwell Papers
1891	*Esquimaux* (Phillips)	550 - 569			*Esquimaux* 1891MS; Southwell 1892, p. 103 - 104; D.S. Henderson in litt.
1891	*Eagle* (Jackman)	700			*Esquimaux* 1891MS; St. John's (Nfld.) *Evening Telegram* 3 Oct. 1891
1892	*Nova Zembla* (Cunningham)	318			Lubbock 1937, p. 425; Southwell 1893, p. 83-84
1892	*Esquimaux* (Phillips)			390[i]	Southwell Papers; D.S. Henderson in litt.
1892	*Maud* (Milne)		40[i]		Lubbock 1937, p. 425; Southwell 1893, p. 84; *Maud* 1892MS
1892	*Terra Nova* (Allan)			221[i]	Southwell Papers; D.S. Henderson in litt.
1894	*Aurora*[f] (Jackman)		800		*Peterhead Sentinel* 16 Oct. 1894, Southwell Papers; *Eclipse* 1894MS
1894	*Balaena* (Fairweather)	820			Southwell 1895, p. 94; Lubbock 1937, p. 429; *Dundee Courier* 9 Nov. 1894, Southwell Papers; *Dundee Journal* 20 Oct. 1894; *The People's Journal* 24 Nov. 1894

1894	*Esquimaux*[g] (Phillips)	360[h]			Southwell 1895, p. 93; Lubbock 1937, p. 429; *Dundee Courier* 16 Oct. 1894, Southwell Papers; *Dundee Journal* 20 Oct. 1894; *The People's Journal* 24 Nov. 1894
1895	*Balaena* (Fairweather)	715[i]			Lubbock 1937, p. 431; Southwell 1896, p. 44 - 45; *Esquimaux* 1895MS; *Dundee Evening Telegraph* 19 Nov. 1895
1895	*Esquimaux* (Adams, Jr.)	686-709			*Esquimaux* 1895MS; Lubbock 1937, p. 431; Southwell 1896, p. 44 - 45; *Dundee Evening Telegraph* 19 Nov. 1895; St. John's (Nfld) *Evening Telegram* 14 Nov. 1895
1895	*Aurora*[k] (Jackman), out of St. John's, Nfld., this season	720 (70 tons)			*Eclipse* 1895MS; *Esquimaux* 1895MS; *Dundee Courier* 4 Nov. 1895; St. John's (Nfld) *Evening Telegram* 14 Nov. 1895
1898	*Diana* (Adams, Jr.)	450			*Diana* 1898MS; Southwell 1899, p. 111; Lubbock 1937, p. 436; *Dundee Evening Telegraph* 22 Sept. 1898, Southwell Papers
1898	*Nova Zembla* (Guy)	534			*Diana* 1898MS; Southwell 1899, p. 111; Lubbock 1937, p. 436; *Dundee Evening Telegraph* 22 Sept. 1898, Southwell Papers; *Dundee Courier* 10 Oct. 1898, Southwell Papers
1901	*Balaena* (Robertson)			104	Southwell 1902, p. 47; Lubbock 1937, p. 440
1901	*Diana* (Adams, Jr.)		110		Southwell 1902, p. 47; Lubbock 1937, p. 440
1901	*Eclipse* (Milne)			106	Southwell 1902, p. 46; Lubbock 1937, p. 440
1902	*Balaena*[l] (Bannerman)		640		Southwell 1903, p. 57; Lubbock 1937, p. 442
1908	*Eclipse* (Milne)			93	Southwell 1909, p. 27; Southwell Papers; *Dundee Year Book* 1908
1908	*Morning* (Adams, Jr.)			218	Southwell Papers; *Dundee Year Book* 1908
1908	*Diana* (Mackay)			217	Southwell Papers; *Dundee Year Book* 1908
1910	*Scotia*			360	D.S. Henderson in litt.; *Dundee Year Book* 1910
1911	*Diana*			540 - 542	D.S. Henderson in litt.; *Dundee Year Book* 1911

[a] "Amongst the small game brought home by the Davis Straits vessels were about 200 White Whales, 220 Narwhals, and the usual number of White Bears . . ." (Southwell 1886, p. 101).

[b] On 17 July joined *Terra Nova* and *Esquimaux* in a drive at Elwin Bay; "killed 12" (*Esquimaux* 1886MS).

[c] Seen at 75°12′N, 76°30′W on 15 June and Cape Adair on 27 August 1888 (*Esquimaux* 1888MS).

[d] In co. with *Terra Nova*, 18 July, between Port Bowen & Mt. Shearer, Prince Regent Inlet (*Esquimaux* 1888MS).

[e] Seen at Cape Adair, 27 August (*Esquimaux* 1888MS).

[f] Seen at Cape Bowen, 12 Sept. (*Eclipse* 1894MS).

[g] Seen with *Balaena* off Cape Bowen, 6 Sept. (*Eclipse* 1894MS).

[h] Plus 61 narwhals or, according to Southwell Papers, 432 white whales and narwhals combined.

[i] May include some narwhals.

[j] 750, according to *Dundee Advertiser*, 25 Nov. 1895, Southwell Papers; 1300, according to St. John's (Nfld) *Evening Telegram* 14 Nov. 1895.

[k] Seen off SE Bylot Island 25 June, off NE Baffin 28 July and 6 September (*Eclipse* 1895MS); in co. with *Esquimaux* at Port Leopold 21 - 24 August and at Navy Bd. Inlet 29 August (*Esquimaux* 1895MS). The white whales caught between 10 and 29 August.

[l] Seen at Lancaster Sound and Pond Inlet floe edge, 21 June to 12 July (*Diana* 1902MSa).

Table 6. Data on white whale and narwhal catches by Scottish pelagic whaling vessels in the Davis Strait whale fishery, 1885 - 1906. Note that some of the hides (skins) and narwhal "horns" were secured in trade from Eskimo hunters.

		Published Data[a]		Logbook Data		
Year	Vessel	White Whales	Narwhals	White Whales	Narwhals	Source
1885	*Esquimaux*	0	70	2	71	*Esquimaux* 1885MS
1886	*Esquimaux*	403	0	399	0	*Esquimaux* 1886MS
1887	*Esquimaux*	600	0	589	1	*Esquimaux* 1887MS
1888	*Esquimaux*	0	0	0	30	*Esquimaux* 1888MS
1890	*Polynia*	317	0	317	5 (54 horns)	*Polynia* 1890MS
1891	*Maud*	0	0	0	9	*Maud* 1891MS
1891	*Esquimaux*	569	0	550	11	*Esquimaux* 1891MS
1892	*Maud*	40	"a number"	0	0	*Maud* 1892MS
1893	*Eclipse*	11	0	0	11 (12 horns)	*Eclipse* 1893MS
1894	*Eclipse*	6	0	0	3	*Eclipse* 1894MS
1895	*Esquimaux*	709	0	686	1	*Esquimaux* 1895MS
1895	*Eclipse*	6	0	0	5 (6 skins)	*Eclipse* 1895MS
1896	*Eclipse*	0	5	0	6 skins, 12 horns	*Eclipse* 1896MS
1897	*Eclipse*	0	0	0	1	*Eclipse* 1897MS
1898	*Diana*	450	0	450	6 (9 horns)	*Diana* 1898MS
1899	*Eclipse*	0	5	0	4 (10 horns)	*Eclipse* 1899MS
1899	*Diana*	0	3	0	3	*Diana* 1899MS
1899	*Esquimaux*	0	0	0	7 (11 horns, 1 skin)	*Esquimaux* 1899MSa,b
1900	*Esquimaux*	0	0	0	0	*Esquimaux* 1900MS
1900	*Diana*	0	0	0	3	*Diana* 1900MSa,b
1902	*Diana*	1	0	0	1	*Diana* 1902MSb
1903	*Eclipse*	33	0	0	25 hides, 12 horns	*Eclipse* 1903MS
1903	*Diana*	4	0	0	4	*Diana* 1903MS
1904	*Eclipse*	53	0	0	2 (plus 5 skins in trade)	*Eclipse* 1904MS
1904	*Diana*	23	0	0	12	*Diana* 1904MS
1905	*Eclipse*	4	2 hides	0	4 (14 horns)	*Eclipse* 1905MS
1905	*Morning*	9	0	1	4	*Morning* 1905MS
1906	*Eclipse*	0	0	0	6 horns	*Eclipse* 1906MSa,b
1906	*Morning*	2	0	0	1	*Morning* 1906MS

[a] See Mitchell and Reeves (1981, tables 4 and 10); Southwell (1884 *et seq.*); Lubbock (1937); D.S. Henderson (*in litt.*, 10 April 1980).

Oil and Hide Production

The Scottish whalers expected to get a ton of oil for every 6 or 7 white whales captured (Wells 1873, p. 231; Southwell 1884, p. 299). In calculating the approximate number of whales taken when the only information available was tons of white whale oil produced, we used a conservative average of 6.5 whales per ton, the figure used by David Bruce and Co. in their statistical summaries of the British whale fishery (Southwell Papers, table dated 24 Dec. 1891).

When the number of hides or skins was given, we assumed it to be equivalent to the number of whales secured. Large hides were generally split into "half-hides" or "sides" before tanning (cf. Stevenson 1904, p. 340), but the returns listed by crews and captains were in hides rather than half-hides. Using the number of hides returned to represent the number of whales actually killed results in a conservative bias in catch figures, as the hides of calves were not always brought on board.

Results and Discussion

Distribution and Migration

Davis and Finley (1979) divided the white whale's annual cycle into five phases: spring migration, summering, late summer, fall migration, and wintering. Our own

FIG. 5. An adult white whale being flensed on the beach at Kangerdlugssuaq, an Inuit hunting camp on Inglefield Bay, Northwest Greenland, late August 1971. Photograph by Fred Bruemmer.

discussion of seasonal distribution is organized by area rather than by season. We defined five major areas in the LSR: (1) Jones Sound and north, (2) Lancaster Sound, (3) Prince Regent Inlet, Barrow Strait, and Peel Sound (4) Admiralty Inlet and the Navy Board Inlet-Eclipse Sound-Pond Inlet complex, and (5) the northeast coast of Baffin Island. Wintering is discussed separately under Stock Identity.

Jones Sound and North

British whalers rarely ventured into Jones Sound, but they often observed white whales as they crossed its mouth en route to Lancaster Sound. For example, the crews of the *Esquimaux* (1888MS) and *Maud* (1891MS) found them "very numerous" near the mouth of Jones Sound during the second week of June (also see Southwell 1898, p. 409; Bay 1904, p. 477). White whales generally do not appear in the vicinity of Grise Fiord until late July (RCMP Game Reports), although forced overwintering (in a *savssat*) has been documented in Starnes Fiord (Freeman 1968), and they have been seen off Smith Island in early spring (RCMP Game Report, Craig Harbour, 1954). Most catches were made at Grise Fiord in autumn (mid-September), when the whales were travelling east and apparently leaving Jones Sound. However, in mid-September 1959 "at least several thousand" were seen moving *westward* near Lindstrom Peninsula (RCMP Game Report, Grise Fiord, 1960).

Riewe (1976, p. 182; 1977, p. 634) claimed that white whales enter Jones Sound at break-up from both Baffin Bay and the Hell Gate-Cardigan Strait area. It is unlikely that large numbers come from the west, unless some white whales overwinter in the Hell Gate-Cardigan Strait polynia (Smith and Rigby 1981). Davis and Finley (1979) believed that "no more than a few hundred" white whales move north and northwest of eastern Barrow Strait in late summer (cf. Soper 1981, p. 8). Osborn (1865, p. 99) reported large numbers moving south along the southwest coast of Devon Island, out of Wellington Channel and into Barrow Strait, on 5 September 1850. The whales in Jones Sound during late August and early September probably have either summered in the sound or migrated in from Baffin Bay. Most white whales reportedly leave Jones Sound during September, "just before freeze-up" (Riewe 1976, p. 182).

White whales also occur far north of Jones Sound, at least to Hall Basin (see Stock Identity section below). Bay (1904, p. 477) reported seeing "large schools" of white whales "in Jones Sound, Hayes Sound [Buchanan Bay], and the adjoining sounds and fjords", but he did not indicate the season for these sightings. Greely (1886, vol. I, p. 75) reported groups of as many as 30 white whales in Hall Basin, just south of the mouth of Lady Franklin Bay, in early August 1881. White whales have been described as "common" in the Thule district of Northwest Greenland during summer (Vibe 1967, p. 76; also see Vibe 1950, p.84; Kapel 1977; Fig. 5), but

Vibe (1967, p. 76) believed "the majority . . . stayed still further north in summer, and herds arrived from the north to Inglefield Bredning in September and October". E. Born (in litt., 20 January 1986) learned from hunters in the Thule district during the 1970's and 1980's that white whales do summer in the Smith Sound region and only arrive in Inglefield Bay in large numbers in September and October. Although they may occur at the head of Inglefield Bay, they are more common in Olrik Fjord and McCormick Fjord, both relatively shallow. Kane (1856, p. 461) expressed the belief that both narwhals and white whales inhabited Kennedy Channel, judging by bones found along its shores.

Prince Regent Inlet, Barrow Strait, and Peel Sound

Large schools, numbering in the "thousands", are seen in Barrow Strait and Resolute Bay, moving from east to west in summer (beginning in late July), and west to east in autumn (early September) (RCMP Game Reports, Resolute; also see Sutherland 1852, vol. I, p. 325; Kane 1854, p. 160). Riewe (1976, p. 176) regarded the peak occurrence of white whales in Resolute Bay to be in late August and September,with most leaving by October.

Few whaling vessels penetrated as far west as Prince Regent Inlet and Barrow Strait before July, but the *Esquimaux*'s (1888MS) crew found "a few" white whales at 73°15′N, 89°30′W on 28 June and "a large number" at 73°46′N, 88°49′W on 1 July in another year (*Esquimaux*, 1885MS). A Franklin search party under Captain William Penny observed white whales and narwhals in Queens Channel as early as 17 June (Sutherland 1852, vol. II, p. 150). "Great numbers" of white whales were seen during the voyages of the *Hecla* and *Fury* in 1824-25 "along the shores of North Somerset and the neighbourhood of Jackson's Inlet [73°18′N, 88°47′W, east side of Prince Regent Inlet]" (Ross 1826, p. 95; Parry 1826, p. 152). Normally, large herds could be found by the whalers in Prince Regent Inlet and off southwest Devon Island by late July and early August.

Peel Sound was not visited by the whaling vessels whose logbooks or journals we read. The Fort Ross and King William Island HBC post journals contain little evidence of the white whale's presence in these areas (Tables 1, 2). However, Manning and Macpherson (1961, p. 207) demonstrated by their own observations and reference to various unpublished materials that Peel Sound is, at least in some years, an area where white whales congregate in summer. They noted one school of at least 30 in a crack in extensive ice cover as early as 21 July, and some white whales were seen south to the De la Roquette Islands as late as 1 September. A total of 1 450 white whales was counted from the air in Franklin Strait and southern Peel Sound between 8 and 13 August 1958. In some years white whales move through Franklin Strait, occasionally to as far south as Rasmussen Basin (Read and Stephansson 1976). Some may circumnavigate Prince of Wales Island in summer, returning east through Barrow Strait. Bernier (1909, p. 71) reported large numbers in Erebus Bay.

Smith et al. (1985) found concentrations of up to 1100 whales in Cunningham Inlet and 3 000 – 5 000 in Creswell Bay, as well as "many" animals offshore, from mid-July to early August. Davis and Finley (1979) considered white whale distribution in late summer to be closely related to the distribution of arctic cod (*Boreogadus saida*), a major prey species. They were unable, "despite many coastal surveys", to locate in coastal areas more than about half of the estimated total population, and they speculated that a large proportion moves offshore during late summer to feed amongst pan ice. They noted that the south coast of Devon Island east to Maxwell Bay is used "inconsistently" by white whales in late summer. According to Smith et al. (1985), "a real reduction in numbers of belugas occupying the high Arctic occurs in August", with increased densities in Prince Regent Inlet and lowered densities in Barrow Strait and Lancaster Sound.

Lancaster Sound

Lancaster Sound, especially the north side, is a major migration route for white whales. In some years, as whaling vessels worked their way up the sound with the retreating and disintegrating floe edge from late June through early July, large numbers were observed between Croker Bay and Navy Board Inlet (*Diana* 1899MS; *Esquimaux* 1885MS; *Eclipse* 1897MS; *Maud* 1891MS), off Bylot Island (*Eclipse* 1899MS), and off the mouth of Admiralty Inlet (Livingstone-Learmonth 1889MS; Markham 1875, p. 154). White whales were "very numerous" in Maxwell Bay on 9 July (*Maud* 1891MS), and "thousands" were sighted from the *Nova Zembla* (1884MS) off Cape Warrender on 7-8 July. There was often a close coincidence between the movements of white whales and whaling vessels through Lancaster Sound during spring. However, the whalers did not usually bother killing white whales in the open sea, preferring to wait until large numbers could be secured with relative ease along the west side of Prince Regent Inlet (see below).

The Scottish whalers made few observations of white whales in Lancaster Sound during summer, possibly in part because of their own tendency to spend this period cruising in Prince Regent Inlet, the Pond Inlet-Eclipse Sound-Navy Board Inlet complex, or Baffin Bay. The crew of the *Esquimaux* (1887MS) found white whales "very numerous" off Hobhouse Inlet on 23 August and "numerous" in Croker Bay on 26 August.

By September, most vessels were either in Pond Inlet or along the northeast coast of Baffin Island, where they very rarely saw white whales. Their lack of white whale sightings can be taken as evidence that large numbers of white whales do not migrate along the north Baffin coast in fall. Judging by records of the Dundas Harbour HBC post (Table 2; see below), the fall migration out of Lancaster Sound occurs principally along the south coast of Devon Island, probably peaking some time in September (see Davis and Finley 1979).

Admiralty Inlet and the Pond Inlet–Eclipse Sound–Navy Board Inlet Complex

The present-day absence of appreciable numbers of white whales in Pond Inlet, Eclipse Sound, Navy Board Inlet, and Admiralty Inlet reported to us by native hunters

(S. Attagootak, I. Milton, J. Enook, T. Allooloo, pers. comm., 31 August 1984; D. Ipirq, pers. comm., 5 September 1984) is substantiated for earlier years by the manuscripts read for this study (also see Ross and MacIver 1982). Although seen along the floe edge at the mouths of these inlets during break-up (RCMP Game Reports; Ellis 1957, p. 5; Burnford 1973, p. 40; Bradstreet 1982), large numbers of white whales do not normally migrate into or through the inlets once a passage westward becomes available in Lancaster Sound (see Bissett 1968a, p. 70, 72). "Sometimes 10 or 15 are seen in the inland waters of Eclipse Sound, usually in August, but this is not a regular occurrence" (Miller 1955, p. 175). Two ice-entrapment events involving white whales, one in Navy Board Inlet and one in Milne Inlet, were mentioned by Freeman (1968). An interesting report, which we have been unable to corroborate, is that white whales used to appear (meaning earlier in the twentieth century) each summer at the head of Admiralty Inlet, in Bell Bay (D. Ipirq, pers. comm., 5 September 1984). If this report is accurate, we have no way of explaining their general absence in Admiralty Inlet today.

Northeast Coast of Baffin Island

HBC post records for the Clyde River area indicate an almost total absence of white whales there. Traditional summer hunting for white whales in Hoare Bay and winter hunting at the Cumberland Sound floe edge (Kemp 1976, p. 138) most likely would have involved the Cumberland Sound stock. Kemp (1976, p. 144) also referred to recent white whale hunting in Home Bay, particularly in Ekalugad Fiord. RCMP reports from 1936 to 1942 refer to white whales as being killed at least occasionally at Clyde and in Home Bay (P.A.C., RG85, vol. 1045, file 540-3, part 3-C). They also indicate that white whales were killed occasionally near Kivitoo (just north of Broughton Island) in summer (Starnes 1925, p. 59) and that "*marsouin*" (French for "porpoise") were frequently shot from shore in Merchants Bay (Millward 1930, p. 48). Since Canadian traders often referred to white whales as "porpoises", we take Millward's use of marsouin to mean white whales. It might also mean narwhals. An RCMP report filed by the Frobisher Bay detachment on 24 October 1958 noted that white whales were seen "on occasion" near Padloping Island and that "a few" were taken there by local natives. On 11 November 1835 "many unicorns and white whales" were seen in the general vicinity of Cape Searle (Anon. 1836, p. 15).

The narwhal and the white whale are partially sympatric, and there is considerable overlap in their diets, both consuming large quantities of arctic cod and Greenland halibut (*Reinhardtius hippoglossoides*), but with the white whale being the more diversified feeder (Vibe 1950; Kleinenberg et al. 1969; Freeman 1968; Davis and Finley 1979; Seaman and Burns 1981; Finley and Gibb 1982; Bradstreet and Cross 1982). Occasionally, narwhals were mixed in the drive catch of white whales in Cumberland Sound (Stewart 1940MS; Fig. 6). In spite of their generally similar distribution and diet, white whales and narwhals differ locally in habits and distribution. In summer at least, narwhals remain in the deep, cold water of sounds and fiords while white whales concentrate in shallow, relatively warm estuaries (Sergeant 1978). What is important to note here is that the subsistence fisheries at such places as Clyde, Pond Inlet, Arctic Bay, Resolute, and Grise Fiord (see below) were poised to take *either* narwhals or white whales, depending on availability and catchability. They were, in a sense, multispecies fisheries, aimed at securing muktuk and, sporadically, hides and tusks. Thus, in an area such as Clyde where narwhals were taken (Mansfield et al. 1975; Mitchell and Reeves 1981) but white whales were not (Table 3), it can be assumed that white whales either were not present or were for some reason less catchable than narwhals. The latter possibility cannot be ruled out. The white whale "is an extraordinarily fast swimmer, easily surpassing the narwhal, which . . . is not nearly so cautious as its white relative" (Degerbøl and Freuchen 1935, p. 267). Bruemmer (1971) heard from hunters in the Thule district of Greenland that white whales have much better vision than narwhals and that they (white whales) "will nearly always elude a pursuing kayak". White whales can, however, be driven with motorboats into shallow coastal embayments where they are shot (e.g. near Godthaab at the turn of this century and elsewhere in western Greenland today — E. W. Born, in litt., 20 January 1986). The markedly different reactions of white whales ("fleeing") and narwhals ("freezing") to approaching ships (Finley and Davis 1984) are consistent with the observations of these two species by hunters.

If the apparent hiatus in summer distribution along the northeast Baffin coast between Prince Regent Inlet and Cumberland Sound (or Home Bay) is not an artifact caused by documentation procedures or by the difficulty of catching white whales in open water, it has implications for the discreteness of the stocks to the north and west and to the south and east of this section of coastline.

Stock Identity

The possibility has been suggested that some white whales winter in Lancaster Sound (Sergeant and Brodie 1975, p. 1049). A herd was seen at sea west of Cape Parry on 6 February 1923 (Vibe 1950, p. 84). Some were observed at the floe edge off the mouth of Buchanan Bay in April 1955 and in Alexandra Fiord in 1962 after freeze-up, "having to break several inches of ice to breathe" (RCMP Game Reports, Alexandra Fiord). White whales were seen in the vicinity of Cape Sabine on 13 and 25 April and 9-10 May 1884 (Greely 1886, vol. II, pp. 290, 298, 302-303). A herd of about 100 white whales was seen near Pim Island, Smith Sound, on 5 April 1978 (Finley and Renaud 1980). Aerial surveys of the North Water, a network of polynyas in northern Baffin Bay (Smith and Rigby 1981), suggested that about 500 white whales wintered there in 1978 and 1979 (Finley and Renaud 1980). In those years Lancaster Sound "remained frozen, with an ice-edge across its entrance, until July". Although the numbers seen were low, it is significant that a high proportion of the whales seen by Finley and Renaud were in dense pack ice rather than at the shear zone. Their observations demonstrate that white whales can overwinter at very high latitudes and in severe ice conditions.

FIG 6. Narwhals infrequently were mixed in the catch of white whales made during the annual white whale drive at the head of Cumberland Sound. This large tusked narwhal has been brought ashore between two white whales. Courtesy Alan and Gwen Ross; photo probably taken in 1940 — see Stewart (1940MS).

It has been observed that both white whales and narwhals appear "eager to exploit feeding areas from which they have been excluded by the ice cover all winter and they are willing to move far from open water early in the spring to do so" (Stirling 1980). They "follow the ice edge closely, immediately penetrating new cracks and leads as they develop." Kane (1854, p. 340) observed white whales and narwhals in Baffin Bay in March, at about 71°N. Killian (1975, *in* Peterson 1979, p. 2534) observed several groups of white whales at the floe edge in western Lancaster Sound/Barrow Strait during the period 13 March - 3 May 1975. Sutherland (1852, vol. II, pp. 252-254) considered the presence of walruses, white whales and narwhals in open water in Victoria Channel during June 1851, "when Barrow Straits and Wellington Channel were one continuous sheet of ice," as evidence of regular overwintering there.

Aerial surveys of northern Davis Strait and southern Baffin Bay in March 1981 resulted in an estimate of about 2 400 white whales wintering in the loose pack ice off the west coast of Greenland (McLaren and Davis 1981). Highest densities were between 67°N and 68°N latitude and within 50 km of the coast. Waters north of Disko Island (70°N) were not surveyed; at any rate Upernavik and Umanak districts have relatively low catches in March (Kapel 1977). The regular winter occurrence of large numbers of white whales along the west coast of Greenland from Disko Bay south is evident from hunting statistics compiled over many years (Winge 1902; Vibe 1967; Kapel 1977).

Forced overwintering, or ice entrapment (*savssat*), has been documented in Starnes Fiord, northeast Jones Sound, in the Navy Board Inlet region, and in Milne Inlet (Freeman 1968), in Glacier Strait off southeastern Ellesmere Island (Freeman 1973) and off the northwest coast of Somerset Island (Davis and Finley 1979). *Savssats* in Disko Bay sometimes result in large winter catches by the Greenlanders (Porsild 1918; Kapel 1977). Ice entrapment cannot always be interpreted as evidence of regular overwintering. It may sometimes represent the failure of a group of animals to follow their usual schedule for migration.

Sergeant and Brodie (1969) compared body size characteristics of white whales from many areas. Included

in these comparisons were 113 whales collected at Ellesmere, Somerset, and Cornwallis islands (i.e. in the LSR), 112 from Cumberland Sound, and 499 from West Greenland (Degerbøl and Nielsen 1930). The whales from the LSR and Cumberland Sound were classified as medium or intermediate in size, while those from West Greenland were judged to be among the largest. It was noted that the LSR animals "may be a little larger than most of this intermediate-size group". These authors concluded that the Cumberland Sound and West Greenland whales, although separated by only 600 km, belong to different stocks, with the possibility of "some mixing through the area of Ellesmere Island where animals of a possibly transitional size occur."

The hypothesis proposed by Davis and Finley (1979) that a large proportion of what they called the Eastern Arctic stock of white whales winters along the west coast of Greenland is supported by historical data (e.g. see Sutherland 1852, vol. I, pp. 325-326). In spite of intensive searching effort by the pelagic whalers along the northeast coast of Baffin Island between July and November, they reported no evidence of a mass movement of white whales along that coast during these months.

The itineraries of British Arctic whalers usually meant that they tried to reach Melville Bay by late May or June, and to cross Baffin Bay through the North Water in June or July (Reeves et al. 1983). Thus they approached the Lancaster Sound Region from the east or northeast. Vessels failing to navigate Melville Bay often turned back and crossed from the vicinity of Upernavik to Cape Walsingham or Cape Searle. These vessels would usually be too late to participate in floe-edge whaling and would, instead, spend the remainder of the season searching for whales in open water along the east Baffin coast or offshore in the so-called "middle ice".

Observations by the pelagic whalers suggest that the northward migration of white whales paralleled in a general way the itinerary of the late nineteenth-century British whalers. In April and May white whales were seen in and near Disko Bay (Table 4). By late May and early June, large numbers could be encountered north of Upernavik and in Melville Bay. Brown (1868, p. 551) claimed the white whale:

> . . . is only seen on the coast of Danish Greenland during the winter months, leaving the coast south of 72°N lat. in June, and roaming about at the head of Baffin's Bay and the western shores of Davis Strait during the summer.

The observation of white whales heading northwest off Whale Sound on 12 June 1897 (*Eclipse* 1897MS) suggests that at least some whales crossed northern Baffin Bay at much higher latitudes. It is reasonable to suppose that many of the white whales seen at the mouth of Jones Sound in June had, like the whalers, crossed from Greenland by way of Melville Bay and the North Water. White whales (and narwhals) have also been reported from north of Jones Sound — at the floe edge near Cobourg Island in early June and in tide cracks in the ice in July, in Alexandra Fiord heading south in late August, and in large schools passing the mouth of Harbour Fiords during the second half of September (RCMP Game Reports, Alexandra Fiord).

There is still the problem of accounting for the whales taken during summer along the West Greenland coast and in the Thule district (Kapel 1977, table 2). According to E.W. Born (in litt., 20 January 1986) white whales are hunted from motorboats during July and August in the western parts of the Thule district, often between Siorapaluk and Cape Inglefield. Some also are taken in Inglefield Bay. Substantial catches are made in September and October as southward-migrating whales arrive in McCormick Fjord, and near Savissivik. White whales occur in Olrik, McCormick and Robertson fiords during summer and fall (Born 1986). Some authors have inferred from catch statistics and the opinions of Greenlandic hunters that some of the white whales wintering off West Greenland migrate to and summer in Melville Bay and the Thule district (Kapel 1977; Andersen et al. 1980; Kapel and Petersen 1982, p. 56 – 57). According to Born, however, the catch in Melville Bay during summer is very low.

A relevant question is whether there is segregation in white whale populations during summer. There certainly is evidence of some degree of segregation, with herds of adult males at times traveling apart from females and young (Lønø and Øynes 1961; Kleinenberg et al. 1969; Degerbøl and Nielsen 1930). In most major summering areas, however, both sexes and various ages are represented.

On present evidence, we cannot dismiss the possibility that the whales distributed in summer all the way from Barrow Strait and Peel Sound, east and north to Smith Sound, Jones Sound, and Inglefield Bay, and south along the Greenland coast belong to one large and widely distributed stock. However, it is likely that there are several or many smaller population units which, even if they mingle during winter, return to specific complexes of embayments, inlets and estuaries each summer. If such homing behaviour is a characteristic trait of white whales, then stock definitions must be carefully considered in making management decisions.

IWC (1980, p. 117, figure 2 and table 1) proposed a useful conceptual model for evaluating white whale migrations and distribution. It was agreed that:

> . . . the hypothesis of wintering grounds shared by several geographical summer populations permits of two major alternative conclusions *vis-à-vis* stock discreteness, namely: (a) wintering group consists of a single inter-breeding stock which disperses in spring, or (b) animals in summering grounds constitute separate stocks which winter in a common area.

It is not yet possible to choose between these two conclusions for the summer population(s) of the LSR and North Greenland. No tagging program has been conducted in the High Arctic to investigate the stock affinities of white whales there.

White whales have been said to "frequent the coast of Melville Peninsula in large schools during the summer months" (MacBrien 1933). Substantial numbers of white whales are taken in some years at the settlements of Hall Beach and Igloolik, both in northern Foxe Basin (e.g. Mitchell 1982, table 4; Semeniuk 1982, p. 39). It is possible that some movement occurs through the Gulf of

Boothia and Fury and Hecla Strait. However, it seems more likely, as suggested by Freuchen (Degerbøl and Freuchen 1935, p. 266), that the white whales seen during summer in northern Foxe Basin and Fury and Hecla Strait belong to a Hudson Bay population and thus arrive from and return to the south.

Catch History

Origin and Methods of Scottish Whaling in Prince Regent Inlet

Before 1868, the British whalers "rarely" killed white whales, "their swiftness and activity giving them more trouble than the oil is worth" (Brown 1868, p. 552; also see Parry 1821, p. 35; Osborn 1865, p. 99). "The white whale is very shy and easily scared, quick in its movements, and very keen sighted; it is consequently very difficult to capture in deep water" (Captain William Adams quoted *in* Southwell 1885, p. 86). The white whale's lack of a tusk made it less valuable than the similar-sized narwhal, which the commercial whalers frequently did hunt from boats over deep water. The whalers nevertheless recognized the value of white whale hides, prized for their "strength and imperviousness to water" (Southwell 1884, p. 299; see Stevenson 1904, p. 341 - 342), and eventually came to appreciate the value of the oil which could supplement that obtained from bowheads (the two kinds of oil were often mixed in the returns). Exploring parties occasionally took white whales for food (e.g. M'Clintock, n.d., p. 302).

As early as 1819 the crew of the *Hecla* observed, and chased unsuccessfully, a "vast number of white whales" at the mouth of Prince Regent Inlet during an exploring expedition (Fisher 1821, p. 72-73; also Parry 1821, p. 35). In 1860 the *Alert* of Peterhead brought home the produce of 111 white whales from a wintering voyage to Davis Strait (*Aberdeen Daily Free Press*, 31 January 1893, Southwell Papers). In 1868 the *Perseverance* of Peterhead took 645 white whales (producing 100 tons of oil) in Cumberland Sound. In 1869 the *Xanthus* of Peterhead got 859 and the *Polynia* of Dundee got 41, all probably in Cumberland Sound (Southwell Papers; *Dundee Advertiser*, 22 Oct. 1869). Prince Regent Inlet was visited by whalers for the first time in 1868 when the *Arctic* killed 40 bowheads there (Lubbock 1937, p. 393). Thus the British white whale catches totalling 2 480 during 1875 - 78 (Mitchell and Reeves 1981, table 10; Southwell Papers) could have been made in either Prince Regent Inlet or Cumberland Sound. Certainly the 32 taken by the *Arctic* in 1874 and the 550 taken by the *Aurora* in 1877 were from Prince Regent Inlet (Table 5). We suspect the *Arctic*'s catch in 1874 was the first made by the British whalers in Elwin Bay.

James Fairweather, master of the *Aurora* in 1883 when she took 800 white whales at Elwin Bay in company with the *Esquimaux*, described the procedure (Fairweather and Fairweather 1928, p. 42 - 43):

> Left to themselves, the white whales would pass the mouth of the Elwin Bay, but they are so timid that they can be driven in by two steamers. Therefore, the modus operandi was this. Two masters agreed to work together and share the proceeds. Arrangements were made that one steamer went the one way along the land, the other the opposite way for an agreed-upon distance. Then both lay quiet for a while and started back for the bay again in time to meet each other at high water there. Each steamer zig-zagged and made all the noise possible, by occasionally opening the boiler blowdown cock for a moment - hammering on the anvil - or making a noise in any way possible. When the two steamers met there was generally a great commotion, the fish jumping almost out of the water. The steamers had then to herd them into the bay. When one went in then they all followed, which was just what was wanted. The steamers then followed as far as the depth of water would allow them, then stopped and lowered eight boats each. These boats spread from side to side of the bay and continued to make a noise while the tide was ebbing. At low water the fish were aground and were easily killed. Next high water they were towed to the beach and hauled above high-water mark. The spoil was then divided by the two chief officers, and each crew skinned their own share and towed them to their steamer, which was about two miles from them.

The same year (1883) the *Arctic* took 1 220 white whales and her master, William Adams, described the procedure this way (*in* Southwell 1885, p. 86 - 87):

> [The white whale] is generally taken in the shallow bays after the ice breaks away from the land. The Grampus [killer whale, *Orcinus orca*] is a great enemy to the White Whale, and great numbers of the latter are often driven by them into the shallows. The fishermen are on the watch for such a chance, and when it occurs all boats are sent in pursuit; they are placed in a cordon round the school of fish, the boats being about equal distance apart and to the seaward of the fish; the boats gradually advance, driving the fish on shore at the most convenient place they can. When the tide recedes the White Whales are left aground or nearly so, and then the slaughter commences, the men jumping into the shallow water and despatching the fish with lances. Sometimes the fish turn and make a desperate rush seaward, great numbers escaping. Nets have occasionally been used in endeavouring to enclose the fish, but I cannot say that on the whole the use of nets has been a success. It has sometimes helped to secure a good result, but at other times the fish in a rush seaward have carried nets and all before them.

We have not been able to determine where the *Arctic* made her large catch in 1883.

Adams's reference to killer whales facilitating the white whale drives raises the interesting question of how often these predators were encountered by the whalers in the LSR. Observations of "grampus" and "sword fish" were recorded occasionally in logbooks and journals (Reeves and Mitchell in press). These undoubtedly are references to killer whales. Killer whales were observed most often in Pond Inlet and along the northeast coast of Baffin Island. Several recent attacks by killer whales on narwhals in Pond Inlet (Steltner and Steltner 1983,

FIG 7. A pod of killer whales observed near the mouth of Koluktoo Bay, August 1985. Although no attack was observed, open wounds on the bodies of narwhals seen in the vicinity of the killer whales suggest that some attacks did occur. Photograph by R. Campbell.

1984; Steltner et al. 1984) and Koluktoo Bay (R. Campbell, pers. comm.; Fig. 7) have been well documented. Inuit hunters told us that killer whales regularly appear in Pond Inlet and Admiralty Inlet in late summer and that their activities dramatically influence the behaviour of narwhals and pinnipeds (see Brody 1976, p. 212, for a published summary of the observations and opinions of native hunters). The two records of killer whales in Prince Regent Inlet (Markham 1875, p. 246 - 247; *Polynia* 1890 MS) suggest that these animals were present at a time (the first week of August) when they could have influenced the movements of white whales, thus affecting the whalers' success in driving whales. However, if the frequency off killer whale observations is accurately reflected in the whaling logbooks and journals, then it seems unlikely that the "cooperation" of killer whales would have been a common or reliable aspect of white whale drives in Prince Regent Inlet.

Other Aspects of White Whale Hunting in Prince Regent Inlet

We read logbooks or journals covering six voyages in which large catches of white whales were definitely made in Prince Regent Inlet (*Esquimaux* 1886, 1887, 1891, 1895; *Polynia* 1890; *Diana* 1898). These vessels reached the inlet as early as 1 July and as late as 27 July. Successful drives occurred between 17 July and 20 August. All the kills were made in Elwin Bay, but the steam-powered vessels drove whales into this bay from as far away as Leopold Harbour (*Diana* 1898MS) and Batty Bay (*Polynia* 1890MS; *Esquimaux* 1887MS; 1891MS). It was explicitly noted on 10 August 1891 that the *Esquimaux* was abreast of Batty Bay, and four boats were sent in "to chace the Fish out". An hour later, the boats were brought on board and the vessel steamed toward Elwin Bay. Tremblay (1921, p. 74; also see Bernier 1909, p. 71) claimed that Batty Bay was "a favorite resort of the Scottish Whalers, where they killed large numbers of white whales which abound in its waters".

White whale driving was perilous and strenuous work. Captain Fairweather remarked that the 800 half-skins and 100 tons of oil obtained by the *Aurora* in 1883 were in return for "a week's very hard work and no little risk, as the ice might have come in at any hour and cut the men off from the steamer" (Fairweather and Fairweather 1928, p. 43). William Adams, Jr., master of the *Esquimaux* (1895MS), wrote after a series of drives in Elwin Bay:

> This is terrible work. I have not been in my bed for 17 days and our ship is in great danger of being driven ashore at any time. The Black whaling [for bowheads] is bad enough but this is one thousand times worse.

Dundas Harbour Post

During the 1920s and early 1930s the RCMP officers stationed at Dundas Harbour caught white whales for dogfood (Starnes 1928, p. 61; 1930, p. 74; MacBrien

Form F.T. 94

JOURNAL OF EVENTS

[illegible] DISTRICT ..... POST

OUTFIT 26[illegible]

Sept[illegible] 19.....

Sheet No.....

DATE TEMPERATURE READINGS WEATHER REPORT	DETAILS
Wednesday 19th	Russell
	turned out fairly good.
	Radio still keeping good.
Thursday 20th	Russell left for along the coast this morning
Clear and fairly	with the Eskimos. Whilst going out the
warm. Winds	harbour, a large school of white whales
fairly strong.	came in and started to play [illegible].
	Hammond tidying the dwelling house and
	opening and making supplies.
	[illegible] and Tokolik each got a white
	whale this afternoon.
	Radio poor this morning; lots of static.
Friday 21st	Russell got back late to night, after being
	about fifty five miles west. West of Cockle
Clear and cold.	Bay as far as was covered, the coast is
Strong S.E winds.	very much exposed to the sea. No
	sheltered harbours which would do for
	camping sites were located. Even with
Good signs of	an offshore wind terrific seas are
foxes along the	continually rolling in. Travelling around
coast.	the capes and headlands proves very
	difficult and dangerous in small boats,
	more especially when towing. The natives
	certainly did not like the appearance
	of land and sea on that direction.
	We can hardly blame them. It was
	decided to turn them back to Cockle Bay
	where a passable camping site was
	found on the west side. Judging by
	the number of seals and porpoises seen
	around there they should have no
	difficulty in procuring enough meat

FIG 8. Dundas Harbour "Journal of Events" for Wednesday, 19 September, to Saturday, 22 September 1934. Courtesy Hudson's Bay Company Archives, P.A.M., B.407/a/1, fos 7 - 9.

Form P.T. 54

JOURNAL OF EVENTS

Lower Savage Rapids DISTRICT Lower Savage Rapids POST

OUTFIT 36 5

September 1934 Sheet No. 4

DATE TEMPERATURE READING WEATHER REPORT	DETAILS
Friday 21st	Continued and fat for their present needs and also put up caches for the coming winter. It is our opinion that the coast further towards Beachy Island affordes more shelter, but we have not the time to spare just now to await favourable weather to make trips down that way in order to look the country over. It is our intention to get down that way as soon as we can after freeze-up, and if possible get the natives to rescind their trapline so that direction where whales around Lower Harbour are very plentiful. For other hunters with their families have been advised to settle in the near vicinity, so that they can conveniently get the use of the Post motor Boat for hunting. The time now before freeze-up, according to weather conditions at present, seems too short for us to waste time exploring the coast and neglect providing for the winter. We feel certain that if the remaining natives moved down in the near vicinity and devoted all their time to hunting, that sufficient caches of meat and fat could be put up, to last all the natives over the dark period at least, and possibly enough to see them through the winter. [illegible] to the Post this afternoon [illegible] with him in the motor boat, [illegible] a charge

HUDSON'S BAY COMPANY

FIG 8. *(Continued)*

Form F.T. 14

JOURNAL OF EVENTS

[illegible] DISTRICT [illegible] POST

OUTFIT 24 E

Sheet No. 4

September 19 24

DATE TEMPERATURE READING WEATHER REPORT	DETAILS
Friday 21st	Continued shoot of whales in the Sundays Harbour. The whales were towed up in the bottom of the harbour, and while Russell was the boat kept them in to the land, the natives, who had landed for the purpose, killed fifteen. After making the whales secure by collecting them altogether and making them fast to the shore, Russell and party started for the Post and got home about midnight. The hunters who have camped at Hooker Bay, came back with their empty boat in company with Russell, to fetch their dogs.
Heavy rain in the mouth of the harbour, and quite a lot in the offing	Barrow spent the day working in the store. Picked up W.H.W. and R in M.K. over the radio to night. But later made the reception very poor.
Saturday 22nd Clear and cold. wind N.W. fairly strong breeze.	Hooker Bay natives departed this morning. We told them to come in occasionally, so as to let us know how they are faring. The other natives who are still around the Post were sent out to bring in the whales which were killed yesterday. They got back at 11.30 pm. The boat were unable to take all the whales. What was left over the boat load they washed over in the harbour together with three more whales, they got to-day. Russell and Barrow working at Store and Supplies.
Temp max min Sept 23 31 " 22 44 Barometer falling	

FIG 8. *(Concluded)*

1932, p. 72). In September 1934 a group of Inuit families and their dog teams were relocated from Cape Dorset, Pangnirtung, and Pond Inlet to southeast Devon Island. An HBC trading post was established there under the management of Chesley Russell (H.B.C., B.407/a/1). White whales were expected to be a major source of human food, dogfood, and oil at this post. They were "very plentiful" around Dundas Harbour and along the west side of Croker Bay, where many of the Inuit were settled (Fig. 8).

The first whaling season at Dundas Harbour was a short but profitable one (Table 2). On 4 October it was noted (H.B.C., B.407/a/1, fo. 15):

> No white whales have been seen since the 29th September. We believe that they have left this vicinity on the migration south. We were very fortunate to strike the tail-end of the migration as we did, and secure enough fat for the coming winter.

Although walruses were hunted during much of the ensuing winter season, few were caught. At one point, fox carcasses were used for dogfood to prevent "the store of walrus and white whale meat from diminishing too rapidly" (H.B.C., B.407/a/1, fo. 52). By mid-February 1935 there was enough white whale meat remaining to use some as a substitute for mud on komatik (sled) runners. It proved to be "just as good as the mud which is generally used. The kometic slides along quite satisfactorily" (H.B.C., B.407/a/1, fo. 72).

In spite of repeated efforts to secure white whales at the floe edge, only one was taken in the spring of 1935 (Table 2). A number of the Inuit families were shifted westward to Maxwell Bay, where it was hoped that walrus and white whale hunting would be more rewarding. Upon his return from a trip to Maxwell Bay, Russell reported on 25 July that white whales seemed more plentiful to the west than in the vicinity of Dundas Harbour (H.B.C., B.407/a/2, fos 18 - 19). He later wondered whether the white whales might "only strike this vicinity [of Dundas Harbour] in any numbers during the latter part of the summer, and the beginning of the fall. Probably on their migratory route south?" (H.B.C., B.407/a/2, fo. 21). The fall season in 1935 is unfortunately not covered by the available post journals, so it is impossible to determine how many white whales were taken. Some catch must have been made, however, as the following April "the white whale hides had to be used as dogfeed" (H.B.C., B.407/a/3, fo. 12).

In 1936 the first white whale was taken on 25 June, and only three more are noted as having been secured at Dundas Harbour through 7 August, when the last of the three available post journals ends (Table 2). Whale nets were employed this year at Dundas Harbour, but "unfortunately they see the nets in the clear water and shy clear of them" (H.B.C., B.407/a/3, fo. 42). A party from the post made a hunting trip westward as far as Beechey Island and Fellfoot Point (Fig. 9), returning on 20 July (H.B.C., B.407/a/3, fo. 38). "Many" white whales were seen (and one was caught) at Graham Harbour; "thousands" were seen near Radstock Bay, all swimming west.

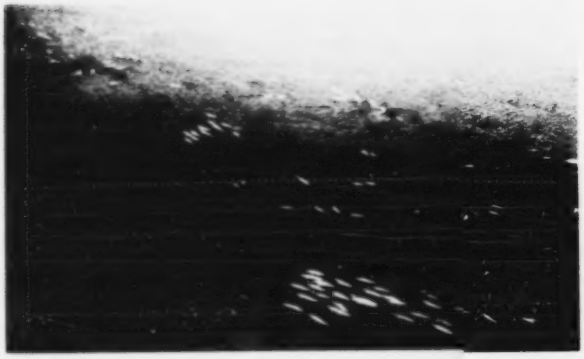

FIG 9. A large group of white whales observed off Fellfoot Point, southwest Devon Island, early August 1973. Photograph by J. D. Heyland.

The Dundas Harbour post did not prosper, and it was closed in 1936 (Usher 1971, p. 133). Hunting in the area certainly continued, however. In summer 1946 Duvall and Handley (1946, p. 30, 119) found seven fresh skeletons, "evidently from the same kill", at Dundas Harbour.

Catches in the Lancaster Sound Region since 1951

The largest catches since 1951 have been made at Resolute and Grise Fiord (Table 3). A native settlement was established at Resolute in 1953 (Dineley 1966). It was noted in an RCMP Game Report for Resolute that by 1967 the demand for white whale carcasses had slackened with the introduction of snow machines for winter transportation. Snow machines were introduced in 1963 - 64 and had largely replaced dog teams by 1966 - 67 (Bissett 1968b, p. 107). This probably accounts for the reduced catch at Resolute after 1963. Before then, white whale meat had been highly valued as dogfood. The muktuk and some of the meat was eaten by the Inuit, and the sinew was used to make sewing thread (RCMP Game Report, Resolute, 1959 - 60). White whale hunting remained an important activity of the Inuit in the Resolute area (including Kuvinaluk, just north of the mouth of the Union River at Creswell Bay) through the 1970's (Kemp et al. 1977 *in* Peterson 1979, p. 2527-2531).

A settlement was established at Grise Fiord in the mid-1950's. White whale hunting there followed a similar pattern to that of Resolute. During the mid-1960's, about 30 - 40 white whales were killed during September in most years, "in the immediate vicinity of Grise Fiord" (Freeman 1968). After 1967, white whales were hunted less intensively, "partly because of bad ice conditions for several years and partly because of a diminishing need for dog food" (Riewe 1977, p. 635). At Grise Fiord, "most of the skin, meat and fat was fed to the dogs, but some of the skin was eaten by the people" (Riewe 1976, p. 182).

The exceptional occurrence of white whales in low numbers in Pond Inlet, Eclipse Sound, Navy Board Inlet, and Admiralty Inlet has made this species "of minor importance in the local economy" at Pond Inlet (Fig. 10) and Arctic Bay (Bissett 1968a, p. 70, 72). The Central Arctic settlements at Spence Bay, Pelly Bay, and Gjoa Haven have reported relatively small catches. Outpost

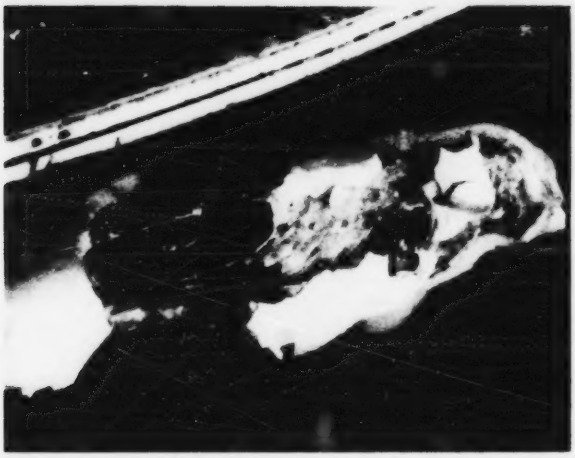

FIG 10. A white whale taken from a net set for narwhals in Koluktoo Bay, 22 August 1964. The animal was partially eaten by Greenland sharks (*Somniosus macrocephalus*) before being removed from the net. Photograph by A.W. Mansfield.

FIG 11. "Narwhals and white whales taken at Creswell Bay", July - August 1949. Courtesy Hudson's Bay Company, file E-347.

camps at such sites as Thom Bay, Creswell Bay, and Brentford Bay presumably have accounted for most of the white whales taken along the coasts of Somerset Island and Boothia Peninsula (Villiers 1969, p. 67; Fig. 11). A white whale is shown by Villiers (1969, plate I) being butchered at Savage Point, Prince of Wales Island, in an unspecified year.

Even considering that catch statistics are incomplete and that some additional mortality results from whales being shot but not secured,the total annual kill of white whales in the Lancaster Sound Region has probably been no more than 100 - 200 since 1951. However, if the same stock has been hunted in winter and spring off West Greenland and in late spring through autumn in Northwest Greenland (Kapel 1977), then hunting removals from the stock may have approached 1 200 animals in some years as suggested by Davis and Finley (1979, p. 31).

Cumulative Catch

Prince Regent Inlet

At least 10 985 white whales were secured by Scottish whaling vessels in Prince Regent Inlet from 1874 to 1898 (Table 5). This total takes into account confirmed landings reported in logbooks and journals or in published sources which state explicitly the catch locality. Since more than one ship usually participated in a drive at Elwin Bay, with the catch being shared (Fairweather and Fairweather 1928), we also have included the catches made by other vessels known to have been present during a drive.

There were only two areas on the Davis Strait whaling grounds where large catches were made regularly, so it is safe to assume that most single-season catches of 100 or more white whales were made either at Elwin Bay or in Cumberland Sound (Fig. 12). If we could not confirm that a given catch was made at either of these places, we used available information concerning the vessel's itinerary, its captain's proclivities, and general trends in the fishery to make inferences about the probable site of capture. Thus, for example, in 1901 the *Diana* reportedly "proceeded to Lancaster Sound in search of White Whales" after taking her first bowhead on 29 June (Southwell 1902, p. 47). Considering Captain Adams's evident predilection to make excursions into Prince Regent Inlet, sometimes for white whaling (e.g. *Esquimaux* 1895MS; *Diana* 1898MS), the catch of 110 white whales by the *Diana* in 1901 was probably made in Elwin Bay. The total of catches *probably* made there between 1880 and 1902 is 2760 - 3082 (Table 5). Some part of this total was probably narwhals incorrectly reported as white whales (see above).

A third category of catches consists of those *possibly* made in Prince Regent Inlet. There is no basis for deciding whether these catches were made in Prince Regent Inlet or Cumberland Sound. In the sample of manuscripts for this study, however, we found no evidence that Dundee vessels fished for white whales anywhere other than in Prince Regent Inlet. The Dundee fleet, even as early as the 1870's, tended to specialize in voyages to Lancaster Sound rather than Cumberland Sound (e.g. see MacGahan 1876, p. 185). A typical itinerary was to reach the Lancaster Sound and Pond Inlet floe edge in June or July; cruise in August as far west as Prince Regent Inlet and Barrow Strait, in Lancaster Sound and the Navy Board Inlet - Eclipse Sound - Pond Inlet complex, or amongst the "middle ice" off the east coast of Baffin Island; and "rock-nose" southward along the Baffin coast in September, October, and early November. Cumberland Sound usually was not visited until October or November, well after the white whaling season there (July to early September — see Mitchell and Reeves 1981).

Other Parts of the LSR

Peter Freuchen claimed that Captain Adams took 750 white whales at Cape Sparbo in Jones Sound in 1911 (Degerbøl and Freuchen 1935, p. 269). According to Freuchen, Cape Sparbo was a place where whalers "now and then cut off large numbers" of white whales. We have no way of checking the accuracy of Freuchen's remarks. However, in 1910 Captain William Adams, Jr., took seven large bowheads on the *Morning* in Jones Sound, an area he had never visited previously (Lubbock

FIG 12. The results of a drive of white whales at the head of Cumberland Sound. Date not known. Courtesy Alan and Gwen Ross.

1937, p. 450), so some part of the 6 031 – 6 143 whales listed as *possibly* caught in Prince Regent Inlet between 1877 and 1911 (Table 5) may in fact have been caught in Jones Sound.

Low (1906, p. 274), a generally reliable source, stated that "large numbers [of white whales] have been taken by the whalers along the coast of North Somerset, both in Prince Regent inlet and in Barrow strait." We have no further evidence that the commercial whalers caught appreciable numbers of white whales in this part of the LSR outside Elwin Bay.

Cumberland Sound

In addition to the 4 552+ white whales previously listed as having been taken in Cumberland Sound from 1921 to 1939 (Mitchell and Reeves 1981, table 11), we now know that at least 5 242 whales were taken there from 1920 through 1939 (Table 7). Thus, our estimate of "greater than 5,000" for the Cumberland Sound stock's size in 1923 is probably even more conservative than was believed previously.

Table 7. Catch data on white whales in Cumberland Sound not included on table 11 of Mitchell and Reeves (1981, p. 670).

Date	Reported Catch	Comments	Sources
20 Sept. 1920	200	In one drive by natives.	H.B.C., D.FTR/13/ 1921, fo. 250
July 1936	240	By driving.	P.A.C., RCMP Rep., 5 August 1937, RG 85, Vol. 1045, file 540-3, part 3-C
1937	-	No drive conducted because HBC "unable to sell the whale hides they secured last year".	P.A.C., RCMP Rep., 5 August 1937, RG 85, Vol. 1045, file 540-3, part 3-C
1938	-	No drive conducted.	P.A.C., Letter from McKeand to Gibson, 5 Dec. 1938, RG 85, Vol. 1084, file 401-2, part 1
July and early August 1939	400+ (rather than previous estimate of 150)		P.A.C., RCMP Rep., 20 August 1940, RG 85, Vol., 1045, file 540-3, part 3-C

Greenland

The principal published source for Greenland catch statistics is the *Sammendrag af Grønlands Fangstlister M.V.* (Summaries of Greenland Hunters' Lists of Game) published by the Ministry for Greenland. Since 1862 a person has been appointed at each settlement to compile information on the catch of mammals (Kapel 1978). The aim was to have a list for each hunter, showing his catch, by species and by half-month. For some periods the catches of narwhals and white whales were pooled (e.g. see Vibe 1967; Kapel 1975). According to Kapel (1978): "From the time this system became well established at most settlements (for some regions it has never worked) up to the beginning of this century, the records are considered very reliable." As settlements have grown, the completeness of the statistics has decreased. An increasing fraction of the catches reported in the *Sammendrag* consists of estimates rather than actual known catches.

This tendency probably causes the masking of trends, at least to some extent (E.W. Born, in litt., 3 October 1985).

The documented level of exploitation of white whales by Greenlanders (Fig. 13) has always been much higher than that by Inuit in the LSR. As early as the 1830s the people of Upernavik hunted white whales with rifles (Sutherland 1852, vol. I, pp. 87-89, 106; Ross 1985, p. 42). Stationary nets were set for white whales at Upernavik during fall (October) in 1850 (Sutherland 1852, vol. I, p. 126), and this practice has continued (Kapel, 1985). F.O. Kapel (in litt., 20 January 1986) provided the following summary of Greenland catch statistics:

> Around 1850 the combined catch of white whales and narwhals in West Greenland (Julianehaab to Upernavik districts) was estimated by Rink (1857, p. 368) at "400 to 500 animals, or more"; in his Appendix I (by Professor J. Reinhardt) the level was given as "well above 500 annually, a small percentage being narwhals." [Another source (Sutherland 1852, vol. I, pp. 325-326) indicates annual netted catches of 200-300 white whales per settlement in Northwest Greenland.] Rink added that an average of 475 pounds of narwhal tusks were traded annually 1853 - 56 (p. 367), that only white whales were taken in Southwest Greenland (south of Egedesminde district), and that about 120 white whales were taken in a special net-fishery near Sukkertoppen (p. 210). Twenty years later, Rink (1877[1974]) estimated the combined annual catch at about 700, of which "more than 600" were white whales and no more than 100 were narwhals (p. 127 - 29). In this later work Rink indicated that an average of 550 pounds of narwhal tusks were traded during 1853 - 72 (p. 312) and again referred to the netting of white whales near Sukkertoppen, where "formerly about 100 white whales were taken in January to March every year" (p. 337).
>
> According to the published Lists of Game (initiated by Rink) the average catch in Southwest Greenland (predominantly white whales) in the period 1874 - 80 was 738 animals (Anon. 1944). In Northwest Greenland (Egedesminde to Upernavik districts) the combined catch of white whales and narwhals averaged 481 in the period 1862 - 70, and 615 in 1870 - 77 (Anon. 1944). The combined average catch of the two species in West Greenland was thus about 1 350 around the year 1875, or almost double as much as estimated by Rink (1877). It is not possible to tell exactly how many were white whales, but they probably accounted for at least half of the number taken in Northwest Greenland, giving a total West Greenland catch of white whales of about 1 000 annually in the late 1870's. During the following two decades, catches (mostly white whales) declined in Southwest Greenland: average 589 in 1880 - 90, 418 in 1890 - 1900 (Anon. 1944). For Northwest Greenland, information is only available for the two years 1887/88 and 1892/93, when a combined catch of 744 and 699, respectively, was taken (Anon. 1944). [Greely (1886, vol. I, p. 75) stated: "In Greenland from five to six hundred are caught yearly, almost all by nets."]
>
> According to the information contained in the Lists of Game, catches of white whales continued to decline in Southwest Greenland in the period 1900 - 1930 (average 255, 429 and 150 for the three decades, respectively). In Sukkertoppen district the netting of white whales continued on a small scale until the beginning of this century. However, in 1917 KGH (The Royal Greenland Trade Department) organized a drive-net fishery near Sukkertoppen, and in the following years a large number of white whales were taken there. These catches were reported separately and are not included in the above-mentioned averages. Unfortunately, the exact number of animals taken is not published for all years, but judging by the amount of blubber produced from this fishery (Anon. 1944, table 179) the number of whales must have been high. The peak catch was in 1925/26 when 1 488 white whales were caught (Degerbøl and Nielsen 1930, p. 142). The total for the three years 1924/25 - 26/27 was about 3 400 animals; for the entire period between 1917 to 1930, when the fishery apparently ceased, the catch was probably in the order of 5 000 - 10 000. The figure 8 487 for the period 1925 - 36 mentioned by Degerbøl (*in* Vladykov 1944, p. 53) probably refers to the net-fishery in the Sukkertoppen district.
>
> In Northwest Greenland the combined catch of white whales and narwhals, as reported in the Lists of Game, did not show any obvious trend during the period 1903 - 30, although large variation did occur (average 550 for 1903 - 10, 893 for 1910 - 20). A special net-fishery was initiated by KGH, in Prøven, Upernavik, where a total of 2 055 white whales was taken during 1926 - 30 (in October - November). This figure should be added to the catch reported in the Lists of Game for 1925 - 30 (average 621, or total 3 105 — including some narwhals).
>
> In summary, available evidence suggests that the total catch of white whales in West Greenland during the period 1920 - 30 was in the order of 10 000 - 15 000, or just as high or higher than during the preceding decade.
>
> In the 1930's catches of white whales were very low in Southwest Greenland (average 43 for 1930 - 38; Anon. 1944 (revised)). In Northwest Greenland the combined catches of white whales and narwhals remained near the same level (694 annually in 1930 - 39). An additional 1 408 white whales were taken during 1931 - 36 in the drive-net fishery at Prøven (Anon. 1944, p. 626, 632).
>
> Since 1939 white whales and narwhals were entered separately in the Lists of Game. Unpublished data for the period 1939/40 - 1946/47 indicate that catches of white whales remained at a low level in South Greenland (average 45). In Northwest Greenland the average catch during this period was 448 (237 - 669), exclusive of the yield from the net-fishery at Prøven, for which information is only available for the 1939/40 and 1946/47 seasons when 127 and 56 animals were landed, respectively.
>
> For the years 1947/48 to 1953/54 the catch statistics have not yet been analyzed (probably because they are incomplete). The net-fishery at Prøven continued at a low level until 1951, yielding an average of 43 (0 - 122) white whales.
>
> Since 1954/55 the information from the Lists of Game has been published in "Sammendrag . . .", and the material has been presented by Kapel (1977), and in the Danish Progress Reports to the IWC. A critical analysis of these data, including the historical information referred to above, remains still to be done.

FIG 13. The American explorer Donald B. MacMillan observed white whales in North Greenland, at Cairn Point on 1 July 1924 (*top*); and at Refuge Harbor on an unspecified date during the 1923 – 35 North Greenland Expedition (*bottom*). Photographs by Donald B. MacMillan; courtesy Peary-MacMillan Arctic Museum and Arctic Studies Center, Bowdoin College.

More than 13 938 white whales reportedly were taken between Frederikshaab and Upernavik during the 22 years 1954 - 75 (Kapel 1977, p. 508). In addition, some white whales were taken each year in the Thule district, but the level of catches there "is not known exactly" (Kapel 1977, p. 507). In a footnote to his catch table, Kapel (1977, p. 508) noted that the catches in 1964 (125) and 1965 (150) "probably indicate the level of annual catch" for the Thule district. However, Bruemmer (1971) estimated only 10 - 15 taken, plus 10 - 15 shot and lost, per year. Born (in litt., 20 January 1986) summarized reported catches from the *Sammendrag* 1975 - 1984, giving an average of 38 white whales per year in the Thule district (Born [1987] estimated an annual take of 60 per year). If 38 is added to the yearly West Greenland total (from Kapel 1977, p. 508) to account for the Thule district catch, then at least 9 212 white whales were taken off Greenland during the recent 10-yr period 1966 - 75.

None of the figures above is adjusted to account for hunting loss (e.g. sinking), which Kapel (1977) judged to be "considerable, especially during the spring hunt and the savssat's, so that the number of animals killed is higher than it appears from the catch statistics". A high proportion of the catch in Upernavik district is made during October when the whales are driven into shallow bays and shot. Hunting loss can be "considerable" in this drive fishery (E.W. Born, in litt., 20 January 1986). White whales are also driven by motorboats into nets in some areas outside the Thule district (Kapel, 1975).

All Areas Combined

If the white whales occurring from the LSR east to Greenland and south along the Greenland coast are judged to comprise one stock, then that stock must have numbered well in excess of 12 000 animals in 1886. Between 1886 and 1895 (10 yr), at least 8 617 white whales were taken in Prince Regent Inlet alone (Table 5), and at least 3 364 were taken during the same period on the west coast of Greenland between Julianehaab and Holsteinsborg (Winge 1902, p. 508). Considering the large catches in years before 1886 and after 1895, the cumulative catch during 1886 - 95 of 11 891 whales is undoubtedly much less than the population size before commercial exploitation began.

Status

Available estimates of the number of white whales currently using the LSR in summer are all within the range of 6 264 - 18 564 given by Smith et al. (1985), although as noted above these authors did not survey the entire summer range of the species within the LSR as defined in this paper. The magnitude of catches by Scottish whalers in Prince Regent Inlet during the late nineteenth century suggests an "initial" (1886) population of well over 9 000 white whales in the LSR, and if there was substantial undocumented use of white whales by Inuit in the LSR during the nineteenth century.

Recent estimates of the white whale population in the LSR are generally consistent with our impressions of earlier levels of abundance, based on cumulative catch. Such consistency suggests that the population was able to sustain removals or at least to recover from their effects after a period of 70 - 80 years with little or no commercial hunting. It must be borne in mind, however, that the cumulative catch estimate of 9 000 may be far too low, particularly if many of the "probable" and "possible" catches in Table 5 were in fact made in the LSR, and if there was substantial undocumented use of white whales by Inuit in the LSR during the nineteenth century.

When Greenlandic catches are taken into account, the estimate of "initial" population size for the entire Eastern Arctic stock is substantially greater. However, in evaluating current status, recent population estimates made from surveys in the LSR then have to be seen as applying to only part of the stock's summer range. Without better information on stock identity, present abundance, and past kills, particularly in Greenland, it is impossible to evaluate the current status of Davis and Finley's (1979) "Eastern Arctic stock". It can be stated, however, that the present population of white whales summering in the LSR is larger, and thus appears to be at less immediate risk, than several other populations in eastern Canada (e.g. St. Lawrence River, Ungava Bay, Cumberland Sound, eastern Hudson Bay).

Conclusions

1. Distribution, Migration, and Questions of Stock Identity

White whales are widely distributed in the eastern Canadian High Arctic in summer, but with major concentrations in at least Barrow Strait, Prince Regent Inlet, Peel Sound, and Jones Sound. Most of those from the first three areas leave the LSR in autumn, moving east along the south coast of Devon Island and then heading north or continuing east. Some overwinter in polynyas within or near the LSR, but the majority presumably move to lower latitudes in southern Baffin Bay and Davis Strait. We searched the literature and archival sources for records of occurrence along the northeast coast of Baffin Island. The absence of autumn records, in spite of the fact that nineteenth-century pelagic whalers searched that area intensively for bowheads, suggests that the southward autumn migration is principally along the Greenland side of Baffin Bay and Davis Strait. We agree with the opinion of Davis and Finley (1979) that most LSR white whales winter off West Greenland. The spring migration appears to follow a route similar to that of the autumn migration, except in the reverse direction. Most whales that leave the Greenland coast do so at relatively high latitudes; thus, they approach Jones and Lancaster sounds from the north or east. Large numbers congregate at the floe edge across Lancaster Sound and Pond Inlet in June. Their penetration westward into the summering grounds follows the break-up and disintegration of ice cover.

As Davis and Finley (1979) pointed out, the differentiation of stocks by Sergeant and Brodie (1969), based on comparisons of body size between areas, has several methodological and conceptual weaknesses. Sergeant and Brodie ignored the evidence on migration timing and

known distribution which points to a common wintering ground for "Greenland" and "Canadian" whales. Although the measurements of the Canadian sample were taken in a straight line, those of the Greenland sample were taken in a unspecified manner. If the latter were taken even in part along the curve of the body, this difference in technique could account for some of the apparent difference in body size between the whales in the two samples. A further problem with the Greenland sample is that no information on color, a crude but useful index for assigning age categories (Fig. 14), was provided by Degerbøl and Nielsen (1930).

FIG 14. A 271-cm, immature, female white whale stranded at the head of Cunningham Inlet, 26 July 1974. According to Heyland and Hay (1976), the whale's brown color, the shape of its head, and the body length suggested an age of 3 - 4 years; there were 5 - 6 growth layers in the teeth, indicating a probable age of $2^1/_2$ - 3 years. Photograph by J.D. Heyland.

Stock identity is not demonstrated at present on good scientific evidence. The location and timing of migration of a large population in the relatively restricted waters of Davis Strait and Melville Bay indicates that the simplest hypothesis is that the eastern Canadian High Arctic and West Greenland populations are one and the same.

2. Need for Direct Evidence of Stock Relationships

The important questions about stock relationships of white whales cannot be answered conclusively until the movements of known individuals are documented. Further studies of morphometrics and biochemistry (e.g. electrophoresis) are likely to produce interesting but not conclusive results, as the evidence in both kinds of studies is inferential and problems of sampling bias are almost unavoidable. The continuing large catch of white whales off West Greenland makes tag recoveries likely if a large sample of white whales were to be tagged in the Canadian Arctic and if, as we assume, the whales migrate between the LSR and West Greenland. Photodocumentation studies, in which individually recognizable whales are "captured" and "recaptured" photographically, might be used to good effect in estuaries (such as Cunningham Inlet — Fig. 15; see Smith 1985), although changes in scarring patterns occur. Such studies should help resolve questions about turnover rate, homing, and population size. However, they are not likely to help resolve stock identity issues since the probability that adequate photographs of known individuals would be taken on the wintering grounds is low. Static visual tags may be useful if placed on enough whales. Given the relatively great amount of time and resources devoted to aerial surveys, branding or marking of the dorsal surface with a large number or symbol might facilitate resighting in the Canadian sector, and might be decipherable on a sighted or killed animal in West Greenland. If this were

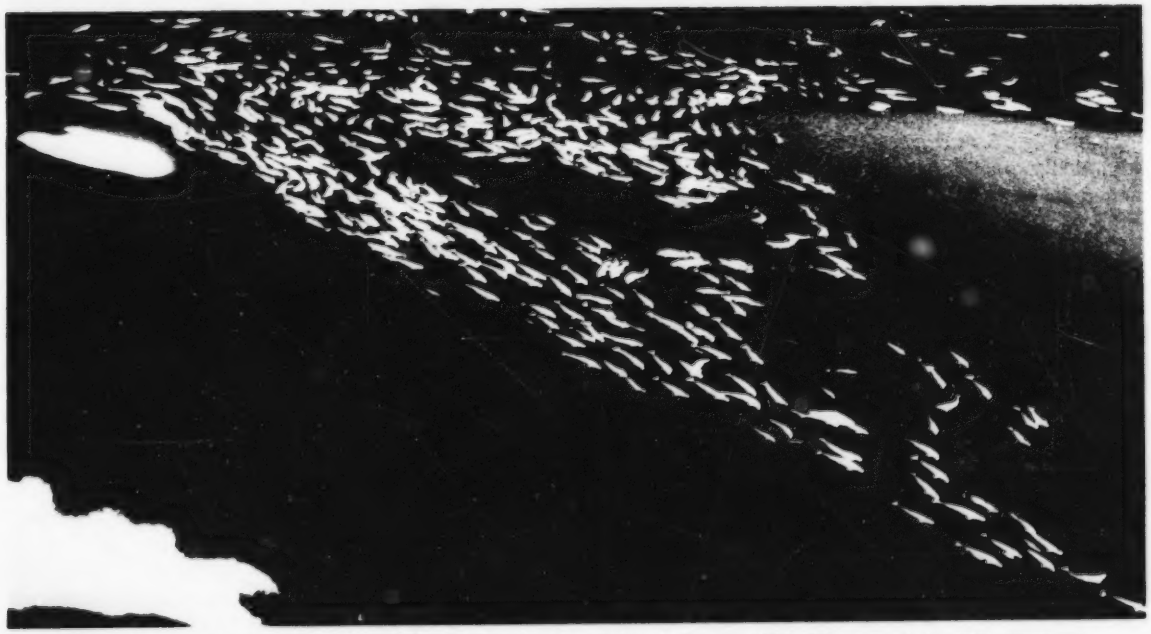

FIG 15. A concentration of white whales in Cunningham Inlet, 5 August 1973. Photograph by J.D. Heyland.

used in conjunction with surface or subdermal tags, the problems of tag loss (and non-reporting) could be studied.

Telemetry, whether by radio or satellite, has obvious advantages. Given the inhospitability of Davis Strait in winter, satellite tracking is clearly preferable to radio tracking.

3. Direction of Further Historical Studies

Although our estimate of "initial" population size for white whales in the LSR is probably much too low, it is, in our opinion, at least of the right order of magnitude and serves as a reasonable lower bound. The stage is set for additional historical work, especially in Scottish libraries, archives, and private collections. It is likely that information exists which would remove the uncertainty surrounding catches listed in Table 5 as "probable" or "possible". As such information becomes available, the estimate of "initial" population size can be expected to increase toward a more realistic and accurate level. If the catch history can be adequately documented, the population's response to exploitation can be simulated.

4. Status of the LSR Population

The LSR white whale population appears to be relatively undisturbed at its major areas of summer distribution. There is no evidence of serious, long-term depletion of this population, particularly when compared with those in the St. Lawrence River (Reeves and Mitchell 1984), Ungava Bay and eastern Hudson Bay (Finley et al. 1982; Reeves and Mitchell 1987a; 1987b), and Cumberland Sound (Mitchell and Reeves 1981). However, if most of this population winters off West Greenland, as seems very likely, then any evaluation of its present status must take into account the large catches made there from at least the 1860's to the present. The inclusion of these catches (and the associated hunting loss) in estimates of "initial" population size causes the estimates to be substantially higher. At the same time, it becomes necessary to include estimates of the number of whales present off West and North Greenland in summer in any estimate of current population size. Without summer census data from Greenland, it is impossible to speculate as to whether the population would appear so healthy when viewed as a combined Canadian-Greenlandic stock.

Acknowledgments

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